FEBRUARY 15, 1958

TECHNOLOGY DEPT.

Telephone Engineer

AND MANAGEMENT

THE TELEPHONE INDUSTRY MAGAZINE

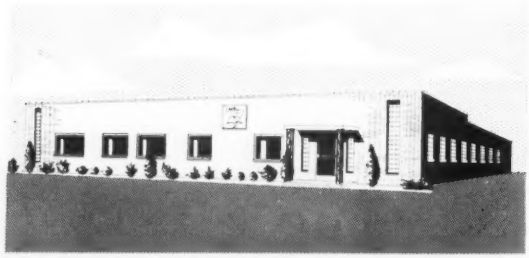
PUBLIC LIBRARY
FEB 20 1958
DETROIT

MOBILE RADIOTELEPHONE SYSTEMS, BY G. E. DODRILL

We Modernized Our Billing Operations by P. A. Froemming

1 out of 13

MID-WESTERN DIVISION
IS ONE OUT OF THIRTEEN DIVISIONS



MID-WESTERN DIVISION BUILDING

The Mid-Western Division is one out of 13 Divisions which serve more than 275 Bell and Independent Telephone Companies in 29 states and Canada for L. M. Berry and Company.

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NOW IN COLOR

Extra long receiver KOILED KORDS in color enable you to offer another service to those subscribers who want to move more than four and a half feet from their instruments.

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Extra long receiver KOILED KORDS are available in colors to match all telephones. See your telephone supply house for full information.

Koiled Kords INCORPORATED

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KOILED KORDS, the original retractile cords, are the result of 17 years of research, development and use.

* KOILED KORDS is a trade mark of KOILED KORDS, INC.

ABOUT THIS ISSUE

IF YOU have been wondering about dial operated mobile radio equipment and how you could put it to work in your own exchange, George E. Dodrill's article — "Mobile Radio Telephone Systems" — on page 43 should provide you with some right answers to your questions.

WHEN The Souris River Mutual Aid Corp. saw its billing procedure growing into a costly system that would require a larger office staff things started happening. In an article titled, "We Modernized Our Billing Operations," Manager Paul A. Froemming describes a system that enables two employes to handle the complete billing routines for a company that serves 2400 subscribers in 25 towns and averages nearly 10,000 toll tickets per month. The article starts on page 47.

REMEMBER the Operating Manual we promised you a few weeks ago? The one titled "Open-Wire Terminations"? It has finally made publication. We hope you'll find the data worth waiting for — and we believe you will, for Author John S. Reed has some good suggestions for handling direction changes and terminations of open-wire leads. The article starts on page 55.

AUTHOR T. DeWitt Talmage concludes his article on "Hand In Hand" with helpful discussions of — (1) Technical aid from the manufacturers; (2) changes in technology; and (3) how to study new things. Be sure to check the list of selected reference material that will help you. The article starts on page 61.

THERE are many other helpful articles in this issue of TE&M. John Reed's "Plant Notes" department (page 68) describes a testing procedure for detecting bad grounds, and a "make-it-yourself" drainage unit that will reduce induced voltage on open wire lines to a safe value . . . . On page 74 Herman E. McDonald tells his story of the first meeting of a new Rural Telephone Association . . . . We hope you like the issue.

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Telephone Engineer

AND MANAGEMENT

THE TELEPHONE INDUSTRY MAGAZINE

VOL. 62 No. 4 FEBRUARY 15, 1958

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FRONT COVER

L. John Denney, president of the Central Virginia Telephone Co., Amherst, Va., operates the push-button, mobile radiotelephone in his car. New system is suited to the communication needs of both home subscribers and mobile radio users. (See complete story on page 43).

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directory facilities & booths form one integrated unit in SHERRON outdoor multiple installations

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Now – there's a way to avoid phone booth tie-ups while patrons look up numbers. Impulse calls don't have time to cool as they do when a patron has to wait for a booth.

In Sherron's multiple booth assemblies, the directory unit is an integral part of the installation . . . and is equipped to accommodate a telephone facility, if desired. Centralizing this unit serves three ways:

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Only Sherron steel booths are designed for continuous, compact appearance. No unattractive, dirt-collecting spaces to increase maintenance costs. No custom parts. No labor or fitting. Single wire entry with all interconnects provided. Consult your Sherron distributor . . . or write us for technical data.

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INDEPENDENT

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Buying the right supplies is a real problem for independent telephone companies. Some supplies give plenty of headaches soon after delivery. Others give years and years of trouble-free performance. How can you tell the difference? How can you be sure that the brand you buy will deliver all the quality you need?

One sure way to insure quality is to rely on a famous brand name that stands squarely behind its product. Another way is to buy from a dependable supplier. You use both methods when you buy FAMOUS BRANDS from AUTOMATIC ELECTRIC.

Automatic's supply service provides a complete line of equipment for you to choose from...Pole Line Hardware... Cable & Wire...Large & Small Tools... Protective Equipment and many other items. And, Automatic really shines when it comes to delivery. Your order is almost always picked from stock and shipped the same day.

Shown here is one of our many supply items—it should fit nicely into *your* operations.

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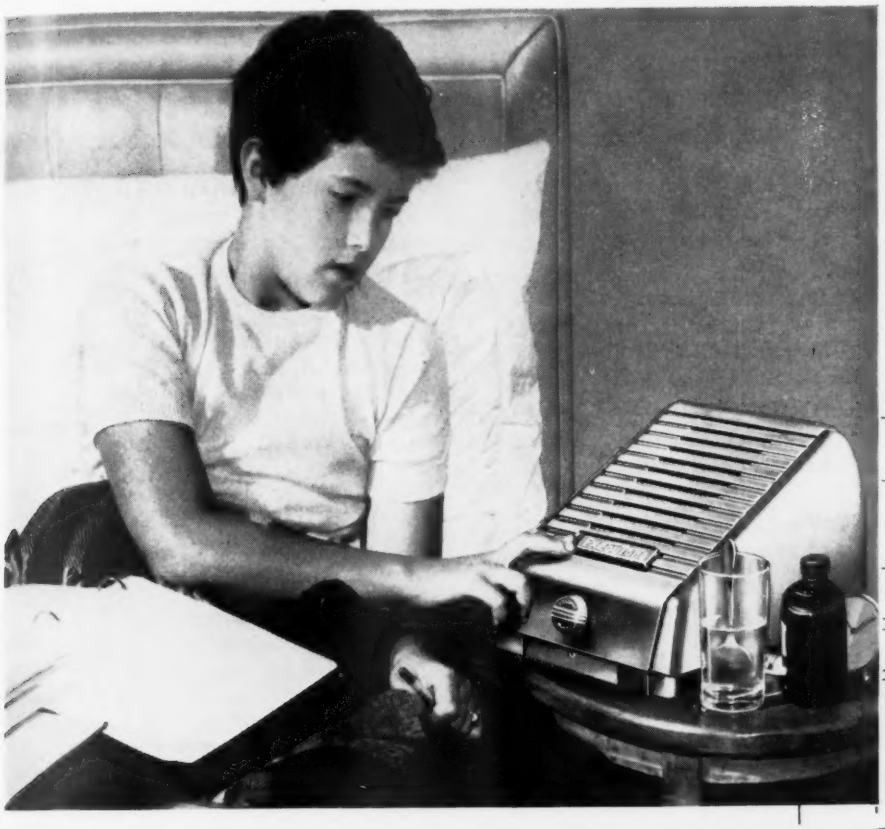
Here's how to provide a real service to your community—and build strong customer relations as well. It's the Executone School-to-Home System! Executone gives your company and the school favorable publicity at no cost. It is estimated that one out of every 300 school age children is hospitalized or shut-in. Through this unique telephone system, the shut-in child can now be instructed at home—with a very simple hookup. A direct telephone line makes two-way communication possible between the home (or hospital)

to School by Telephone!



and the school classroom.

Executone School-to-Home equipment consists of a compact amplifier and microphone-speaker for the student, an amplifier unit for the school and a portable classroom station.

You can supply the Executone School-to-Home System to your community's schools, at modest cost. For complete information, call your Automatic representative or your nearest A. E. Sales Corporation warehouse.

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It's as simple as that! . . . and Commercial installations are proving this point to hundreds of users year after year. So whenever you order cords—remember, A-B-C and be satisfied!

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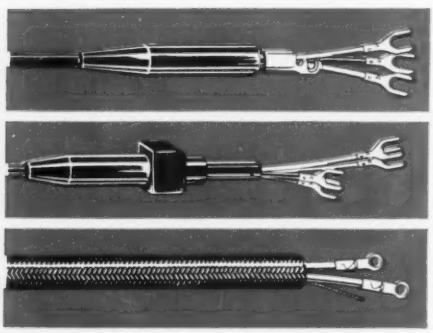

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coming CONVENTIONS

MINNESOTA Telephone Association, St. Paul Hotel, St. Paul, Feb. 17-19, 1958.

TEXAS Telephone Association, Baker Hotel, Dallas, March 3-4, 1958.

KENTUCKY Telephone Association, Phoenix Hotel, Lexington, March 4, 1958.

IOWA Independent Telephone Association, Hotel Fort Des Moines, Des Moines, April 8-9, 1958.

NORTH DAKOTA Telephone Association, Gardner Hotel, Fargo, April 14-15, 1958.

OHIO Independent Telephone Association, Deshler Hilton Hotel, Columbus, April 14-16, 1958.

NEBRASKA Telephone Association, Paxton Hotel, Omaha, April 22-23, 1958.

INDIANA Telephone Association, Claypool Hotel, Indianapolis, May 7-8, 1958.

WISCONSIN State Telephone Association, Plankinton House Hotel, Milwaukee. May 14-15, 1958.

ILLINOIS Telephone Association, Hotel Pere Marquette, Peoria, May 21-22, 1958.

MISSOURI-KANSAS Telephone Associations, Town House, Kansas City, Kans., May 26-27, 1958.

PENNSYLVANIA Independent Telephone Association, Bedford Springs Hotel, Bedford, May 26-28, 1958.

MAINE, NEW HAMPSHIRE, VERMONT Telephone Associations, Somerset Hotel, Rockland, Maine, June 3-5, 1958.

CALIFORNIA Independent Telephone Association, Sheraton-Palace Hotel, San Francisco, June 4, 5, 6, 1958.

NEW YORK Telephone Association, Scaroon Manor, Schroon Lake, June 16-18, 1958.

OREGON Independent Telephone Association and Washington Independent Telephone Association, Multnomah Hotel, Portland, Ore., June 19, 20, 21, 1958.

MICHIGAN Independent Telephone Association, Pantlind Hotel, Grand Rapids, Sept. 9, 10, 11, 1958.

ARKANSAS Telephone Association, Hot Springs, (Hotel To Be Announced), Sept. 15-16, 1958.

ROCKY MOUNTAIN Telephone Association, Hotel Utah, Salt Lake City, Utah, Sept. 17-19, 1958.

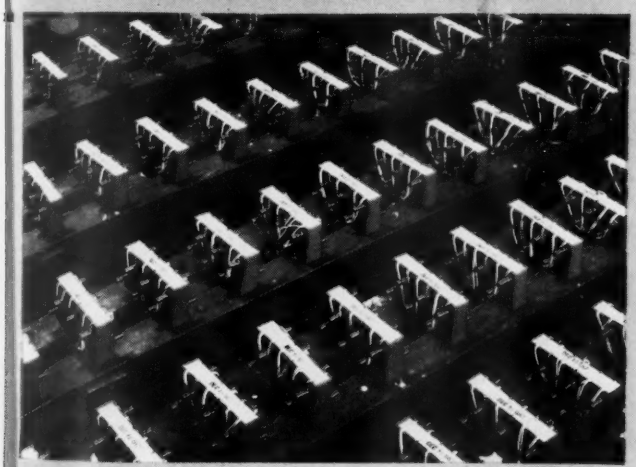
UNITED STATES Independent Telephone Assn., Conrad Hilton Hotel, Chicago, Oct. 13, 14, 15, 1958.

VIRGINIA Telephone Association, Roanoke Hotel, Roanoke, Oct. 30-31, 1958.

OKLAHOMA Telephone Association, Huckins Hotel, Oklahoma City, Nov. 5-6, 1958.

ALASKA Telephone Association, Baranof Hotel, Juneau, Alaska, Nov. 12-13, 1958.

One section of a busy assembly line.



Terminal Blocks filled with thermosetting reinforced polyester resin.

Ready-Access Cable Terminals ready for shipment.

Meeting your demands!

Reliable Ready-Access Cable Terminal

Reliable's busy production lines are keeping up with the Industry's requirements for the 100 Series Ready-Access Cable Terminal.

This easily installed and easily maintained terminal and splicing facility is designed for use with plastic jacketed and plastic insulated conductor cable. Up to four 6-pair Reliable No. 105 Terminal Blocks can be added or the space can be used for loading coils.

The flexible neoprene cover is conveniently folded back while internal wiring is altered to meet changing requirements.

Reliable Catalog 100 includes complete details of the Ready-Access Cable Terminal. Write for your copy.

Reliable ELECTRIC COMPANY • FRANKLIN PARK, ILL.

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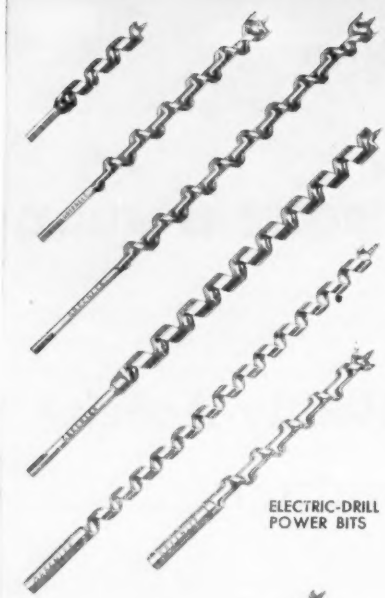
high-quality, long-lived
BORING TOOLS
for pole, crossarm, and timber work . . .



TOOLS FOR CRAFTSMEN
GREENLEE

Whether you need to bore deep or shallow holes, small or large, there is a GREENLEE bit, drill, or auger for the job! Various lengths and styles for electric drill or hand-brace use. All of highest quality materials and correct design for easy boring, clean cutting, and long life under hard usage. Stocked by leading telephone supply distributors . . . see yours or write direct for literature.

Greenlee Tool Co., 2002 Columbia Ave., Rockford, Ill.

Al and Dink Robb

AL AND DINK ROBB, the father and son team that owns and operates the Electra (Tex.) Telephone Co., are planning great things for March of 1958. The Golden Anniversary of their company founded by A. L. Robb will also be the Golden Wedding Anniversary of Al and his wife. An anniversary directory cover, to be distributed in March, will of course be golden in color. Dink Robb, is actively running the telephone company while Father Al handles his many interests in and around Electra including a cattle ranch of some size. We look forward to personally congratulating them at the coming Texas Telephone Association convention that meets in Dallas on March 3 and 4. Hope to see you.

Industry Loses Two Veterans

DEATH, as it must to all people, came to two prominent members of our industry during the latter part of January. *Fred Pfaender*, 94, president of the New Ulm (Minn.) Rural Telephone Association, a past president of that organization and a member of its Board of Directors. *Jim Pfaender* of Stromberg-Carlson, Chicago, is keeping the Pfaender name active in our industry.

W. J. McIlvane, 62, until his retirement executive vice president of the Copperweld Steel Co., Wire & Cable Division, died January 26 from a heart ailment. He was well and favorably known on a national scale by telephone people. He retired a few years ago because of health and until recently was officing in Washington aiding several corporations in attracting executive material for their operations. This was a hobby for Bill McIlvane as he was noted for his aid to younger people. His son, *Bob McIlvane*, is now carrying on the family name to the telephone industry. Both Mr. Pfaender and Mr. McIlvane were old friends of the writer and we join the families in their bereavement.

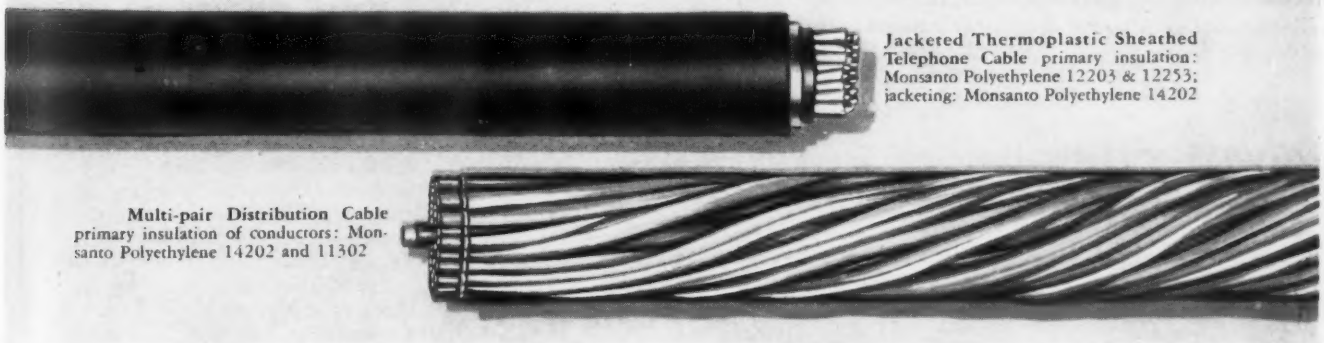
Florida Convention

AS THIS IS written wintry blasts of icy winds and falling snow keep reminding us of our visit to attend the annual convention of the Florida Telephone Association in Florida during December. The convention program was outstanding and our hats are off to *Jo Poppleton*, perennial secretary of this active association. The convention has grown larger each passing year and the meeting at Miami Beach was a well run and conducted one. Miss Poppleton is outstanding in her job as secretary of this group and has our thanks for the hospitality she arranged for out-of-state visitors. *Mitchell Drew*, president of the Florida association was impressive in his report for the year. How we wish their 1958 convention was scheduled for tomorrow!

Big Book In The Works

WE ARE NOW well started on the 1958 Edition of our TELEPHONE ENGINEER'S Catalog-Directory of Industry Suppliers. Editor *John Reynolds* of this yearly issue is enthusiastic about the coming issue as he is publishing a group of Operating Manuals in the Plant Man's Handbook section that will be invaluable to all telephone companies. The issue will be sent to EVERY telephone company in North and South America and will contain valuable information and advertisements of the leading manufacturers.

THE MESSAGE IS: MONSANTO



Jacketed Thermoplastic Sheathed Telephone Cable primary insulation: Monsanto Polyethylene 12203 & 12253; jacketing: Monsanto Polyethylene 14202

Multi-pair Distribution Cable primary insulation of conductors: Monsanto Polyethylene 14202 and 11302

for your reliable "single source" of ***polyethylene*** *wire and cable insulating compounds*

For primary insulation, for jacketing, for steel support wire insulation—every one of the expanding series of Monsanto Polyethylene insulating compounds has been formulated for extrusion efficiency, great mechanical strength, and electrical requirements to fit your specific needs.

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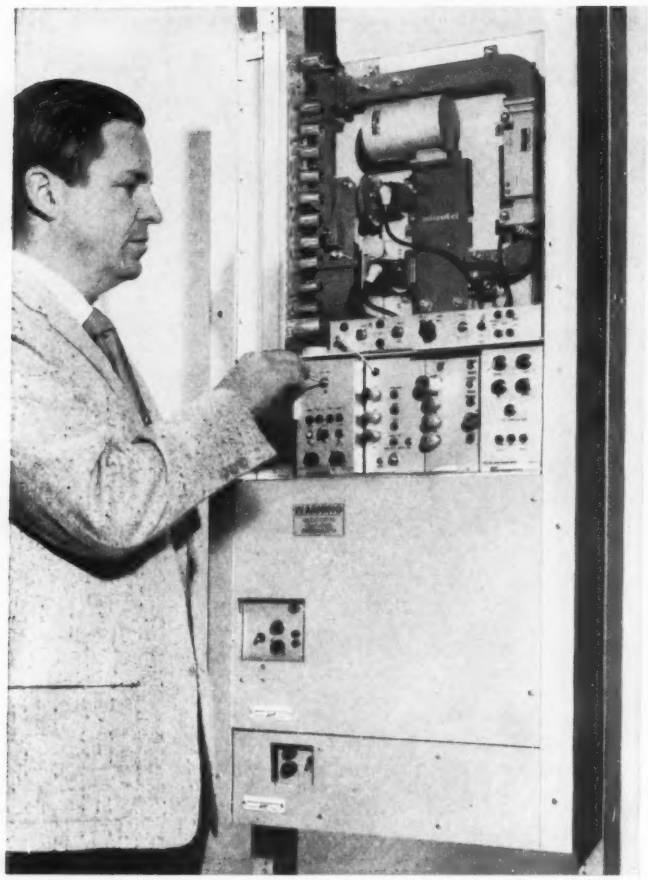
Expand toll circuits this fast economical way—

microtel



Basic terminal of Microtel equipment consists of transmitter, receiver, and power supplies.

NEW LENKURT microwave system designed for telephone use

Microtel Type 74A equipment operates in the 5925-6425 mc common carrier band. This new system is clean in design, highly reliable, and so flexible it meets the needs of telephone companies of all sizes.

In its simplest form, a Microtel terminal consists of a microwave-frequency waveguide assembly, intermediate-frequency amplifier, four plug-in units for input and output circuits, power distribution, and alarms and system supervision. All plug-in units are similar to Lenkurt's 45-class equipment, simplifying routine maintenance and inspection.

Like Lenkurt 45-class carrier equipment, Microtel is easy to expand. A system installed initially with only a few carrier channels, can be expanded economically to a high-density inter-city system. With 8 transmitters and receivers operating over a common path, a system can handle up to 1920 voice channels, plus 128 or more supervisory, remote control, or telemetering channels.

FEATURES:

- ***Power options***—Operates from standard office battery supplies or from 115-volt a-c mains.
- ***Ease of installation***—Standard 19-inch rack mounting; compact plug-in construction; space saving, back-to-back installations.
- ***Ease of maintenance***—Components accessible from front; built-in test facilities.
- ***Standby flexibility***—Frequency diversity or space diversity; combining or transfer facilities.
- ***Economical expansion***—With r-f circulators, 2, 3, or 4 terminals can be added to same antenna system.
- ***System length***—Up to 300 miles with medium loading and multiple repeater points.
- ***Repeaters***—Back-to-back terminal equipment permits dropping and reinserting of channel groups; automatic switching permits unattended operation.

New, *illustrated booklet includes Microtel technical summary, application ideas, additional helpful information. Phone Fillmore 5-7111, or write today for your copy. Automatic Electric Sales Corporation, Northlake, Illinois. In Canada: Automatic Electric Sales (Canada) Ltd., 185 Bartley Drive, Toronto. Offices in principal cities.*

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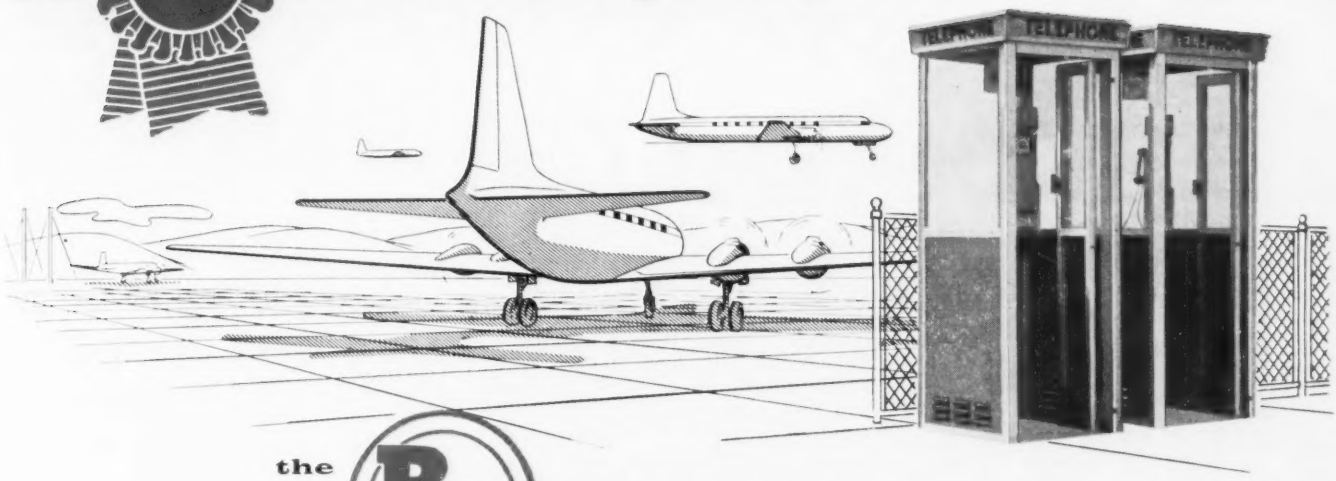

the **BN Booth**

attracts the eye day or night,
promotes more revenue. Colorful, clean, sturdy –
the BN Booth is best for you, too!

For full particulars, consult your distributor or write direct for folder... Benner-Nawman, Inc., 3421 Hollis Street, Oakland 8, California.

a B-N booth is a busy booth!

Say mister... won't those spikes you use ruin that pole?

Some poles maybe, but not this one, it's a T-C, and T-C poles are pressure-treated for a deep uniform penetration of the preservative. When these spikes dig in, they dig into the treated wood . . . and can't hurt it a bit. We've found T-C pressure treated poles are the best for us . . . they last longer.

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TAYLOR-COLQUITT CO.
SPARTANBURG, SOUTH CAROLINA

PLANTS AT SPARTANBURG, SOUTH CAROLINA AND WILMINGTON, NORTH CAROLINA

One Arrow staple gun fastens them all!

ONLY ARROW'S T-25 STAPLE GUN TAKES 3 STAPLE SIZES TO FASTEN ANY INSIDE OR OUTSIDE WIRE UP TO ¼" DIAMETER!

Tapered striking edge gets into tight corners!

- T-25 staple gun holds ⅜", 7/16", and 9/16" round crown, rust resistant staples, a full ¼" in width.
- Safe! No short circuits possible automatic mechanism stops staple at right height
- Short span handle provides comfortable grip – minimizes fatigue.
- Arrow tackers are jam-proof! Can't jam even when struck against metal! Never any lost time on the job. Fully guaranteed
- No wire sag ever! If staple used doesn't hold wire taut, simply use next shorter leg length to insure firm hold and neat job.
- Staple leg lengths are long enough to insure firm hold in wood, plaster or composition board, etc. Tack-pointed staple legs diverge to give even greater holding power.
- Check staple supply in tacker simply by looking on underside of gun.

T-25 LIST PRICE: **$15.00**

Try Arrow without obligation!

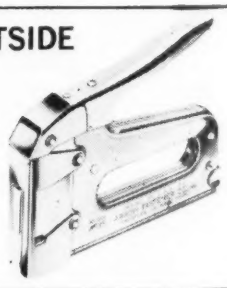
Tackers will be sent an approval for test purposes. Send request to Telephone Division.

Available at your regular supply house. Priced for volume use!

ARROW T-75 FOR ANY INSIDE OR OUTSIDE CABLE UP TO ½" IN DIAMETER!

- T-75 tacker holds 9/16", ⅝" and ⅞" tack-pointed, rosin-coated staples, a full ½" in width.
- Fastens 21 pair inside wiring cable, 26 pair, 12 pair wires, etc.
- Has all above mentioned Arrow features (except tapered head) to insure maximum speed and efficiency of operation!

T-75 LIST PRICE: **$15.00**



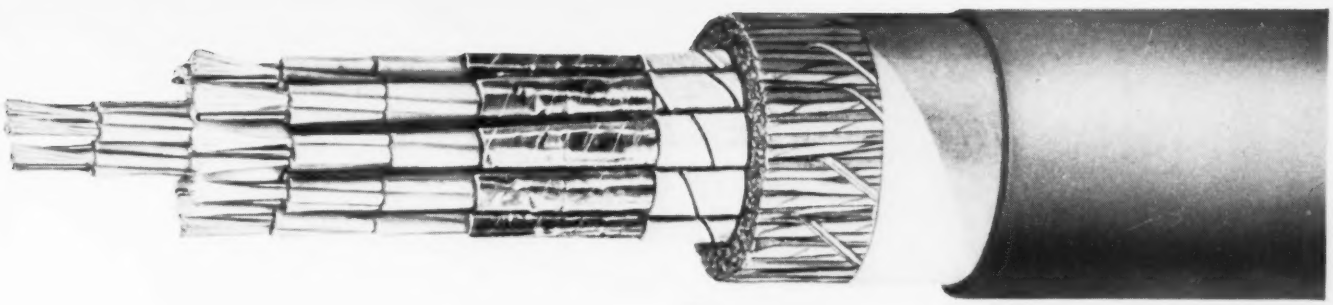
ARROW FASTENER CO. INC. 1 Junius Street, Brooklyn 12, N. Y.

Will you be ready with

VIDEO PAIR CABLES?

General Cable, *alone* among the independent cable manufacturers is producing cable of this new and improved design. Why? To help you *now*, under your current expansion programs, get ready for the mass of technical, recreational, educational and specialized data of all kinds that will have to be carried over public communication systems.

General Cable video pairs may be had combined with any type of telephone cable construction, or as pairs alone, properly sheathed for whatever type of installation you may require. Contact your nearby General Cable representative. It will pay you to be ready today for tomorrow's new business.



VIDEO PAIR

Balanced broad band transmission circuits* for video and carrier—closed circuit TV—links to microwave stations —remote TV pickup—digital data transmission.

*Low signal to noise ratio
*Low attenuation
*Low shield resistance
*Low noise and cross talk levels
*Small phase distortion
*Low echo suppression

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Telephone circuits.

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Aluminum Lead
Stalpeth Alpeth
for aerial or duct installation

Also available with armor for direct earth burial or submarine use.

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Washington NEWSLETTER

Highway Reimbursement Provision Hit By Proposed Amendment

PROBLEMS OF public utilities on Capitol Hill regarding their right to reimbursement for highway relocation costs show no signs of abating, and in fact the difficulties have broken out in a new quarter.

Without prior warning, Senator Francis Case (R., S. Dak.), a prominent member of the Senate Public Works Committee, introduced a bill which would limit reimbursement from federal funds to 50% of relocation expenses, and only in states where the law requires the state to pay for all or any part of the cost of relocation.

Senator Case's measure provided that "Whenever a state is required to pay for all or any part of the cost of relocation of utility facilities necessitated by the construction of a project on any of the federal-aid highway systems, federal funds may be used to reimburse the state for 50 per centum of the amount of such cost which the state is obligated to pay."

The bill also specifies that this provision shall be applicable only with respect to federal-aid highway projects covered by formal project agreements executed by the Secretary of Commerce subsequent to the date of enactment of this act."

Meanwhile, the Bureau of Public Roads reported that anticipated legislative proposals from the Secretary of Commerce, amending the reimbursement provision of the 1956 highway law and restricting the right of utilities to locate facilities on highway rights-of-way, are being reviewed and should be sent to Congress soon. Only "technical difficulties of a minor nature" prevented the measures from having been already completed as this column was written.

Pension Funds

PROVISION which would permit a pension fund to buy limited amounts of the grantor corporation's debentures under specified conditions without losing its tax-exempt status, generally meeting a serious problem raised by Bell System and other spokesmen during hearings more than a year ago, has been included in the technical tax revision bill passed by the House.

The measure, aimed at eliminating unintended tax benefits and disadvantages, may reach the Senate floor for action this year. Hearings were held on the House side by a Ways & Means subcommittee headed by Rep. Wilbur D. Mills (D., Ark.), who now heads the full committee.

"Present law provides that where a pension trust and certain other tax-exempt organizations make loans without adequate security to the creator of the organization, such as an employer corporation, a prohibited transaction is deemed to have occurred and the organization loses its tax-exempt status. The proposed regulations (of the Internal Revenue Service) have held that the purchase of debentures of an employer organization on an open market constitutes a prohibited transaction because there is no collateral and, therefore, that there is not adequate security.

"The bill provides that the purchase of a debenture of an employer corporation by a pension trust is not to be deemed to be a prohibited transaction if certain specified conditions are met. These conditions are designed to give assurance that the purchase was made in an arm's length transaction at a fair market price; that not more than a quarter of the assets of the pension trust are invested in the bonds of the employer; that the trust purchases not more than 25% of any debenture issue of the employer; and that loans subsequently made by the employer will not be given more favorable treatment from the standpoint of collateral."

Investigation of Private Line Rates and Services Moves Slowly

THE FEDERAL Communications Commission's investigation into private line rates and services of the nation's major domestic common carrier systems is moving slowly, with a scheduled hearing Feb. 17 expected to be postponed. In the alternative, the sessions may resume briefly and then again be recessed.

One major reason for the lack of speed being made is the substantial amount of additional information requested of the American Telephone & Telegraph Co. by the FCC staff and the General Services Administration late in January. The requests were submitted after staffs of the two organizations pored over a vast amount of cost study data submitted by AT&T and the Western Union Telegraph Co. early in December.

In its letter, the FCC staff asked, among other things, for data in connection with the AT&T license contract with the associated Bell Sytem companies. Among this information are to be the work sheets of the AT&T General Department showing revenues from and allocation of expenses incurred in license contract services; a statement fully describing license contract services; the General Department's billings to associated compa-

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nies for service outside of the license contract and comparable charges allocated to Long Lines, by months, for 1955; and analysis of 1955 billings by the Bell Telephone Laboratories to AT&T.

Also requested were operating statements and balance sheets for the Teletype Corp. for 1946-56, along with a breakdown of sales to Western Electric and representative prices on sales to Western and to the associated companies and Long Lines.

Also moving slowly, but at least well into the hearing process, is the FCC's proceeding on the Long Lines tariff providing for the furnishing of private mobile communication systems, which has long since developed into one of the most controversial Commission proceedings on non-broadcast matters in recent years.

Up to a week's recess which was called after three weeks of almost continuous sessions, the three witnesses for Long Lines in the case had been cross-examined — Assistant Vice President Harold M. Botkin, General Commercial Engineer Richard B. Holt, and General Methods Engineer Frederick G. Hollins.

Objecting to substantial amounts of the direct testimony which had been presented in written form last September, and vigorously cross-examining the witnesses, attorneys for intervenors also have asked for a variety of additional information which was to be offered when the hearings resumed Feb. 10, and at least Mr. Holt will have to return to the witness stand.

The number of attorneys taking part has gradually dwindled as several out-of-town lawyers departed after spending a few weeks with the case, but four Washington attorneys for clients vigorously opposed to the Long Lines tariff have remained on the scene, and have joined with FCC and Justice Department counsel in extensive questioning.

Still to give direct testimony are two witnesses on behalf of the Bell System associated companies — Dr. Austin Bailey, AT&T Mobile Radio Engineer, and AT&T Sales & Servicing Engineer W. H. Riggs.

Topics of cross-examination have included a large number of situations which could conceivably crop up under the tariff; its relationship to the January, 1956, antitrust consent decree between the Bell System and Justice; the reasons for filing the document, and how it was decided to file it in its present form; and what AT&T would supply, or not supply, under the tariff.

The intervenors are attempting, of course, to demonstrate that the service is not an appropriate common carrier offering over which the FCC has jurisdiction. If the Commission rules that way, provision of such systems would be barred under the consent decree, and the second phase of the hearing — the rates and regulations specified under the tariff — would become moot. The Bell System sees no difference between providing private mobile communication systems and other type of private line service which it offers.

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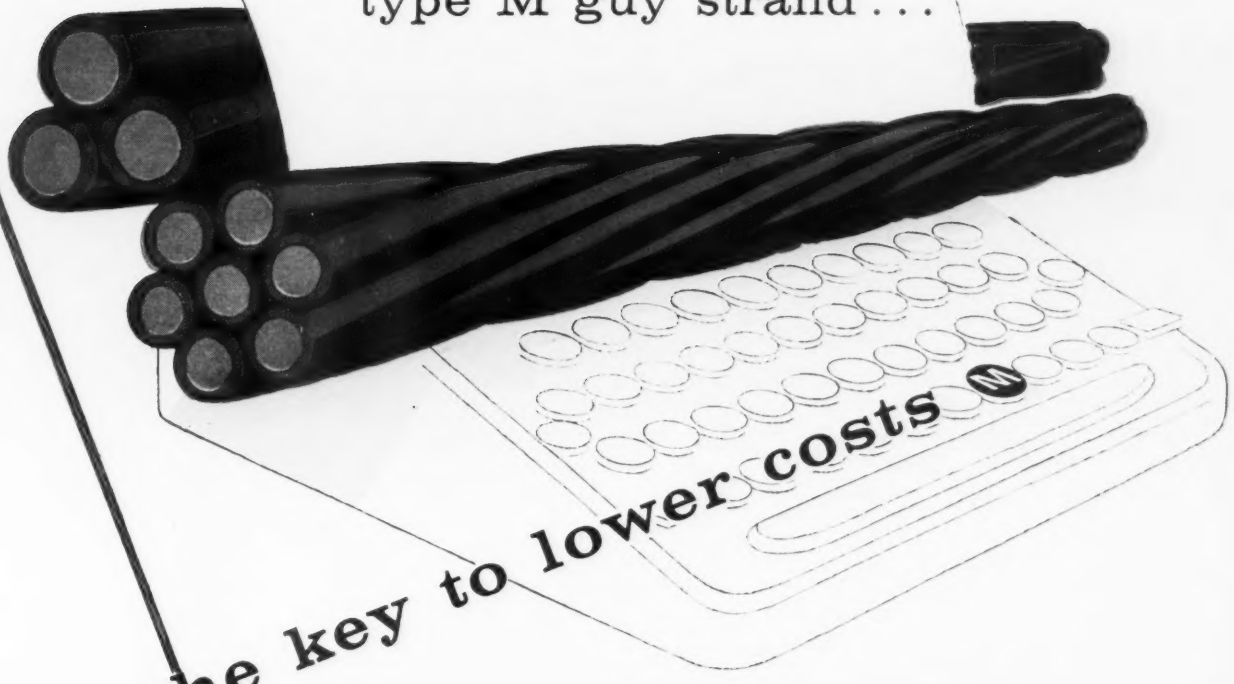

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"ALCOA BOOTH IN RESORT AREA EARNS $333 PER MONTH"

D. W. Busse of General Telephone Company of Wisconsin, reports

"We installed an Alcoa® Outdoor Booth in the heart of this vacationland late in the spring. At the end of the year, it had produced a total of $2,000 added revenue for us. In fact, we were so pleased with the original installation that we added the second Alcoa Booth late that summer. Even though many of the vacationers had headed for home, it boosted earnings at this location over 20%."

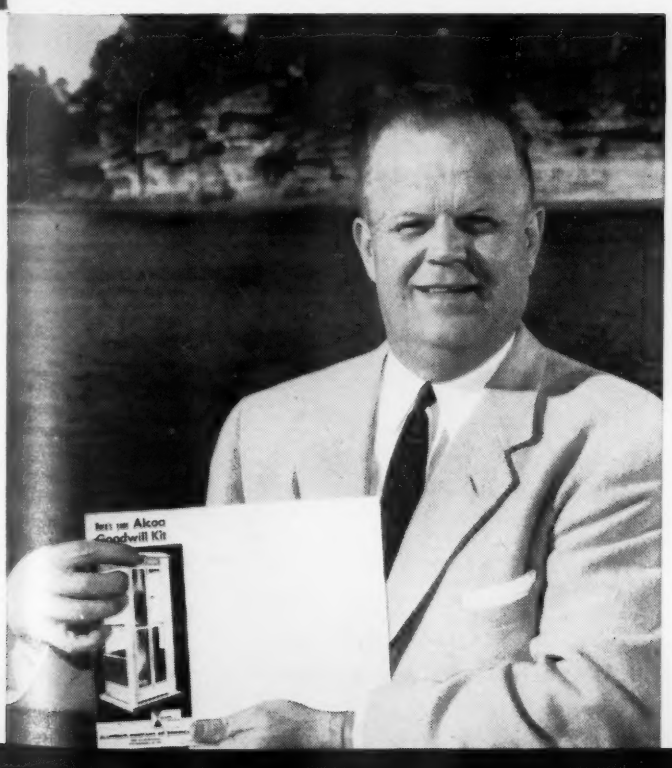
The General Telephone Company services this area with four outdoor aluminum booths. These Alcoa Booths are sturdy as well as attractive. They demand a minimum of attention—stay trouble-free, resist vandalism. Local residents and passing motorists all appreciate their convenience, their 24-hour availability.

"As a result of our excellent experience with these outdoor booths," says Manager Busse, "we plan to install three or four additional booths in this area."

D. W. Busse, General Commercial Manager of the General Telephone Company of Wisconsin, Madison, Wisconsin, standing near the Alcoa Booth installation at Wisconsin Dells. This famous vacation resort area, 55 miles north of Madison, is one of America's greatest scenic attractions. It stretches 12 miles along the Wisconsin River and includes, in addition to its beautiful rock formations, a pioneer village, ghost town, deer park, Winnebago Indian village and other interesting sights.

"LABOR INVOLVED? FOUR HOURS TO INSTALL," reports Mr. Busse. "Each booth comes in subassemblies, separately packaged. Our men just follow the detailed instructions. After assembly, only four hours is required for installation. Parts are interchangeable for easy replacement."

"OUR BUSINESS IS SERVING THE PUBLIC," says Mr. Busse. "We think the Alcoa Goodwill Kit is a perfect helping hand in letting our customers know how we're trying to serve them better." The Goodwill Kit contains ads, publicity releases, TV and radio commercials and bill enclosures printed in two colors on aluminum foil.



"MAINTENANCE? WE JUST WASH THEM," says General Commercial Manager Busse. "Pencil marks or grease smudges wipe right off. We'll never have to spend a cent for painting or rust removal with these Alcoa Booths."

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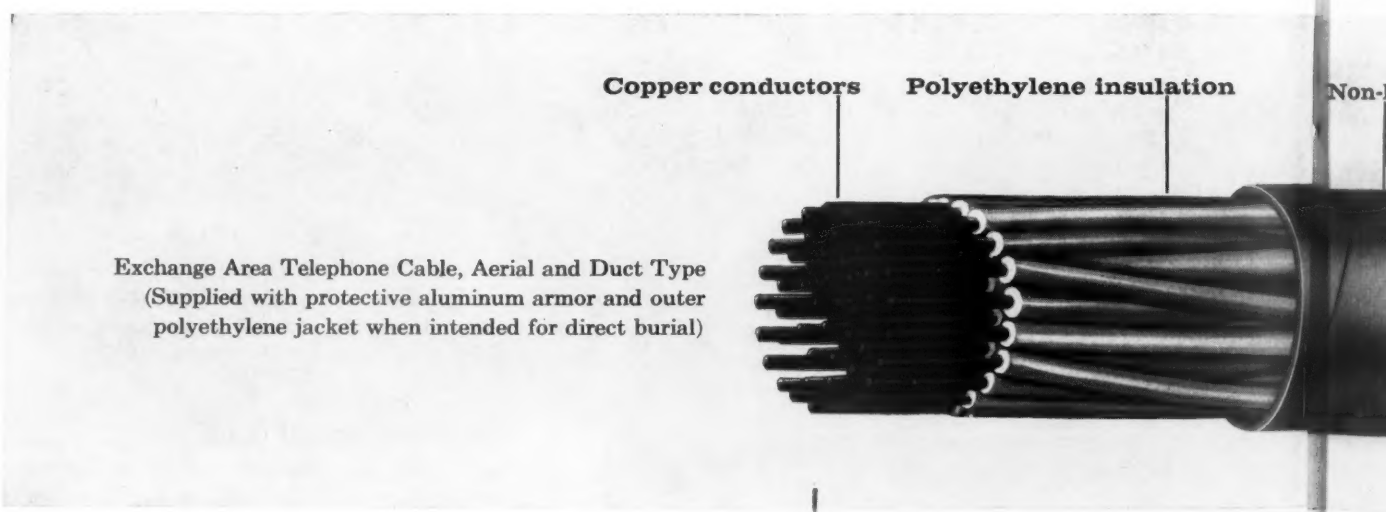

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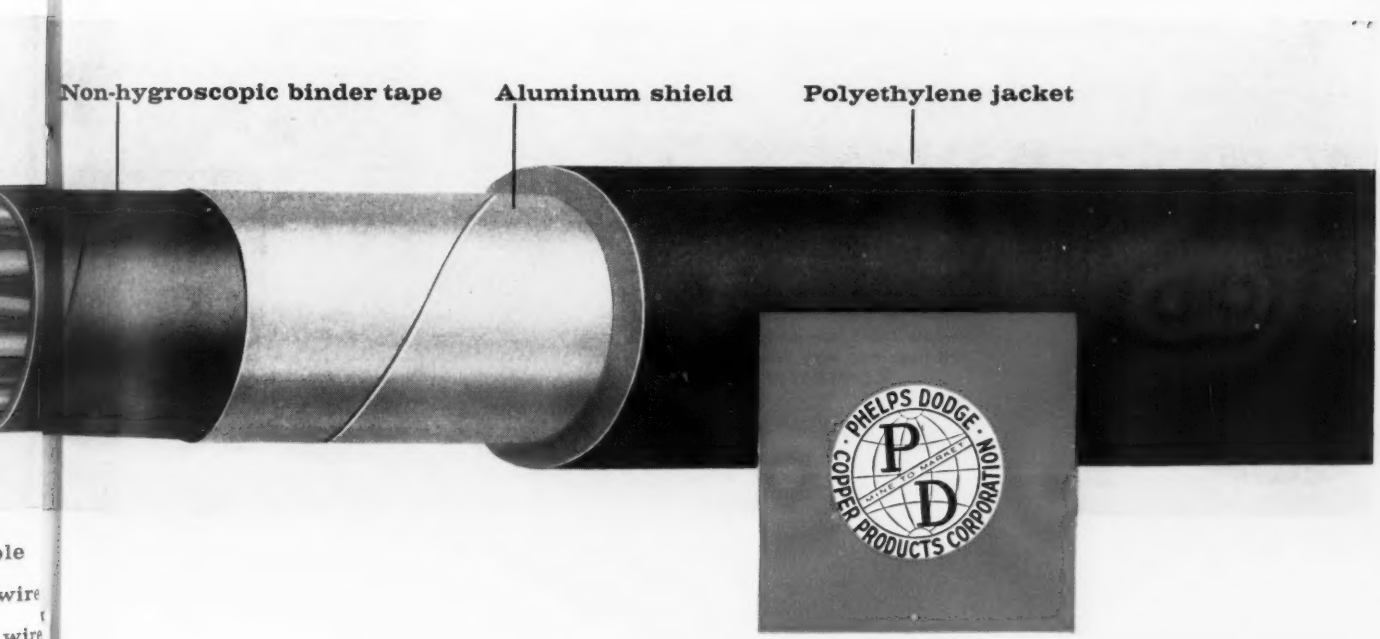
**Mylar—Du Pont's polyester film.*



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Vibration Dampers used on wire adjacent to insulators on pole to prevent fracture from fatigue caused by wind vibration. Made of flexible polyethylene, and helically slit with approximately three turns to the foot.
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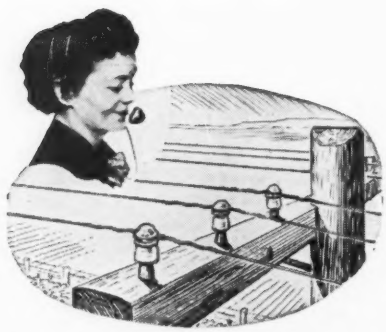

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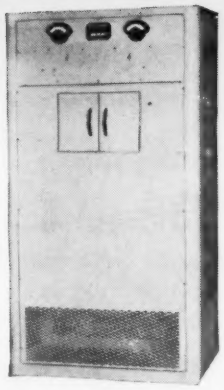

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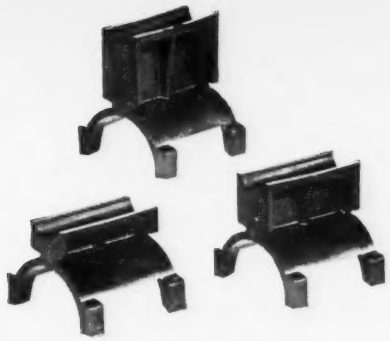

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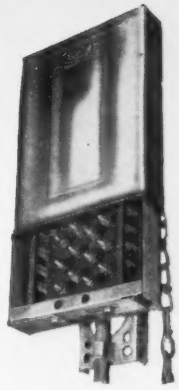

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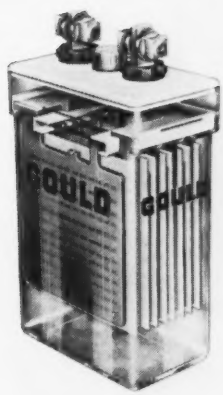

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industry NEWS briefs

Rate Increase Activity Shows Pick-Up As Companies Seek To Match Expenses

FACED WITH fact that rising operating costs must be matched with increased revenues, U. S. telephone companies closed books on '57 and led off 1958 activities with actions aimed at obtaining increased rates to improve declining earnings. Spot checks by TE&M news editors showed following: —

GENERAL TELEPHONE CO. of Southwest had boosted rates at five Texas exchanges: Tahoka (966 stations); Beckville (208 stations; dial conversion); Bonham (2812 stations, dial); Howe (dial conversion); Mertzon (dial conversion).

ARVIG TELEPHONE CO., Pequot Lakes, Minn., new owner of Backus and Hackensack exchanges, will boost rates at the two exchanges following completion of $331,000 plant rehabilitation and dial conversion. Total rate base at the exchanges after improvements and conversions will be $961,065. Approved rates will produce net income of $27,430 — *a* 2.85% *return* on a rate base that misses the million dollar mark by only $38,035. The Arvig Tel. Co. has borrowed $331,000 from REA to finance conversion and improvements at Backus and Hackensack.

RATES FOR residential and business telephones went up January 31 in Ontario and Quebec. The varying increases affect all communities in Ontario and Quebec. The Bell Telephone Company of Canada had asked the Canadian Board of Transport Commissions for an over-all increase of seven percent for residential and business and long-distance charges which would have brought in another $24,200,000 revenue annually. The commissioners granted the company the equivalent of a flat rate of three percent, giving it an added $10,318,000 revenue.

PALISADE (Minn.) Telephone Co. will increase rates at Palisade upon completion of rehabilitation and dial conversion projects. Rate base after projects have been completed will be $38,590. Rates will produce $7,957 in net income; a 5.3 percent return on rate base.

AT&T Holders OK $718,313,000 Debentures Issue

FACED WITH problem of financing an expansion program that may find telephone industry's construction expenditures hitting close to the 2½-Billion mark by year's end, the nation's telephone companies last month started work on task of raising the dollars to finance the job.

American Telephone & Telegraph Co. became the pace setter when its shareholders approved a plan to sell $718,313,000 of convertible debentures and thereby set the stage for the biggest private securities issue in U. S. corporate history.

The debentures will bear interest at 4¼ percent and will mature in 15 years. They will be offered for subscription at face amount to shareholders of record January 24 in the ratio of $100 worth of debentures for each nine shares of stock they own. The debentures will be dated March 12, 1958, and be convertible into common stock beginning on that date at $142 a share, payable by the surrender of $100 of debentures and the payment of $42 in cash.

Elsewhere, other U. S. telephone companies faced with expansion programs requiring sizeable cash outlays moved ahead with plans to raise the necessary dollars. For examples: —

ROCHESTER (N. Y.) Telephone Corp., concluded arrangements to place a $10 million offering of first mortgage bonds, due 1991, with a group of institutional investors. The securities were priced at par. Direct placement of the 5 percent bonds were negotiated by First Boston Corp. in October, 1957, when bond market conditions were much less favorable. The investors included trust companies, savings banks, commercial banks, pension funds, insurance companies and a university. Proceeds will be used in part to repay bank loans with the balance applied to the company's construction program.

AN OFFERING of 160,000 shares ($4 million) of West Coast Telephone Co. $1.44 dividend convertible junior preferred stock was placed on market via an underwriting group headed by Blyth & Co., Inc. The securities were priced at $25 per share. Proceeds will be used to repay loans and finance part of the construction program.

STOCKHOLDERS of Bell Tele-

phone Co. of Canada approved the company's plans to increase capital stock to $750 million from $500 million and create $100 million in debt securities at a special meeting on March 13. The $100 million in debt securities will be issued in one or more series and will consist of bonds, debentures or debenture stock, accordingly. The Canadian Parliament recently passed a bill permitting the company to double its authorized stock to $1 billion. At the close of 1957, Bell had 17,983,980 shares of $25 par stock outstanding out of 20 million shares authorized. Under the new plan, Bell of Canada has 30 million shares authorized.

Mergers-Consolidations Continue Pace: Arvig Tel. Co. Absorbs Eight Systems

CONTINUING THE property merger and consolidation pace set in '56 and '57, first month of new year ('58) found many U. S. telephone companies extending their service areas by purchasing rights-of-ways, easements and properties operated by smaller companies. Here's press- time summary of activities: —

IN MINNESOTA, where program of merging small units has been going at full speed for past three years, Arvig Telephone Co., Pequot Lakes, extended its service area by purchasing rights-of-way and easements of Deerfield Township Telephone System, (20 stations) Bull Moose Township Telephone System (25 stations), McKinley Township Telephone System (40 stations), Powers Township Telephone System (63 stations), Ponto Lake Township Telephone System (63 stations), Hiram Township Telephone System (36 stations), Birch Lake Township Telephone System (81 stations), Woodrow Township Telephone System (78 stations). Purchases add 406 subscribers to Arvig Tel. System.

CHENANGO & UNADILLA TELEPHONE CORP., Norwich, N. Y., purchased plant and system of Farmers Union Telephone Co., Gilbertsville, N. Y., for $16,900. Farmers Union furnished magneto telephone service to about 330 subscribers in the towns of Butternuts and Morris, both in Otsego County. About 27 percent of the telephones it served are subscriber-owned. Chenango & Unadilla Tel. Corp. plans to convert the Farmers Union plant to dial operation by 1961 at an estimated cost of about $150,000.

IN MINNESOTA the Home Telephone Co. purchased the telephone property of the Sandness Farmers' Telephone Co. Sandness Tel. served 26 stations near Cottonwood, Minn.

New REA Loans Finance Initial Service For 900 Rural Phone Subscribers

DURING January, REA's telephone loan division had a busy time for itself. Net result of the activity added up like this: telephone loans totalling $1,491,000 to borrowers in four states to finance initial service for over 900 rural subscribers, improved service for hundreds of present subscribers, construction of 300 miles of new lines, six new dial central offices, and other system expansions and improvements. REA's January loans went to: —

South Central Rural Telephone Co-op, Glasgow, Ky., $433,000. The co-op, headed by Robert E. Eaton, pres., and Daniel B. Corman, mgr., will use the loan funds to: (1) construct new dial office at Bonnieville and 127 miles of new lines, and complete construction of the previously authorized system. With its total of $3,223,000 in REA loans, the South Central Co-op will be able to provide new and improved service to 5,922 rural subscribers over 1,493 miles of line.

Champaign County Telephone Co.,

CORDS BY Runzel

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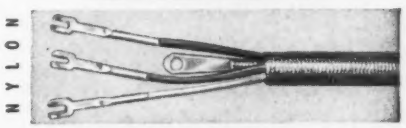
BEST



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Are you familiar with the features of these fine cords?

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Take your choice—Neoprene, Nylon or Cotton. They're all high quality cords made in accordance with Runzel high standard of quality. We carry a large stock of cords for every purpose.

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"Telephone" Tree Pruner

Here's the standard, the choice of the utility industry for years. Powerful action to cut cleanly—tough and almost unbreakable—easy to handle. No. 12 Pruner Head has 1½" cutting capacity. The lighter, No. 11, handles up to 1" branches. Both are malleable iron castings with tempered steel cutting blade.

Poles (18 ft. 3 sections) are of selected spruce with positive locking, seamless aluminum, telescoping ferrule joints.

FAST CUTTING PRUNING SAWS

Designed for fast, easy cutting—large, deep teeth, finest Swedish charcoal steel, streamlined, laminated hardwood handles. Every model you need up to chain saw work.

No. 20 POLE SAW HEAD

Tough aluminum head with large hook and outside horn for pushing branches, raising wires, etc. Also paint brush holder with wire clamp that holds brush securely. Fast-cutting 16" blade. Poles available.

FREE: Send for Seymour Smith catalog pages on tools for utilities. Keep them on file for easy reference.

Quality Tools
SEYMOUR SMITH
Since 1850

SEYMOUR SMITH & SON, Inc.
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Champaign, Ill., received additional $295,000 loan, to raise its REA loan total to $2,452,132. President James L. Capel and Manager Max G. Hoagland will use new loan funds to acquire, rehabilitate and integrate facilities of North Harwood Tel. Co., Ludlow, Ill., complete construction of authorized system; and improve headquarters facilities. North Harwood now provides magneto service to 135 subscribers over 26 miles of line. New construction includes new dial central office at Ludlow and 12 miles of line. Most of the acquired line will be rebuilt for continued use. The completed system will enable company to provide new and improved service to 5,315 subscribers. The system will consist of 1,130 miles of line and 16 exchanges.

ARDMORE TELEPHONE CO., Ardmore, Tenn., $275,000 loan. Company headed by F. C. Merrell, pres., proposes to use loan funds to furnish initial service to 405 rural families and improve service to 181 existing subscribers by extending its operating area into Limestone and Madison counties in Alabama. Existing subscribers now receive magneto service from Elkmont Tel. Co. and New Market Tel. Co. at New Market. These companies operate 28 miles of line and exchanges at both towns.

New dial central offices are scheduled at Elkmont and New Market and 108 miles of new line will be added in the expanded area. Of the existing line, 20 miles will be rebuilt for continued use and 8 miles retained.

Loans to Ardmore Tel., now total $602,000. The completed system will bring new and improved service to 1,528 rural subscribers in Giles and Lincoln counties, Tenn., and in Limestone and Madison counties, Ala. The completed system will consist of 280 miles of line and an exchange at Ardmore, Tenn.; in addition to the two provided for in this loan.

SHELL LAKE TELEPHONE CO., INC., Shell Lake, Wis.; $488,000, first loan, to improve and expand telephone service in rural areas of Burnett and Washburn counties. A. B. Quam, pres. and mgr. of Shell Lake Telephone Co. will use loan funds to finance improved service for its 751 rural subscribers and initial service for 200 farm families in the area. Construction includes new dial central offices at Sarona and Shell Lake and 53 miles of new line. Of the existing line, 167 miles will be rebuilt, 23 miles retained in place, and the remainder retired.

Reports Prove Industry's Growth And Expansion Continuing at Rapid Rate

DOMINATING the news as '58 started its second month was the fact that year-end reports on 1957 operation indicated telephone growth and expansion had continued at the pace set in '55 and '56.

Year-end statement of Carl D. Brørein, president of Florida's Peninsular Telephone Co., reported growth and expansion of Peninsular Tel. Co., paralleling that of the Central West Coast area, continued at a rapid rate through 1957. Number of telephones in service increased 35,800 for a company total of approximately 327,700. Toll calls placed were up 23 percent. Six new buildings were started or completed and an additional 1,148 persons were given employment with the company.

Reporting that people are talking more than ever before, Brorein said 17,976,446 long distance calls were placed from Peninsular's operating area during 1957.

"During the year," he said, "72 switchboard positions and 340 long distance circuits were added. To enlarge and improve service the company spent approximately $22.6 million for gross additions . . ."

Brorein's year-end report on Peninsular Tel. Co. operations is typical of results being reported by telephone companies in all sections of U. S. Here's sampling of reports that reached TE&M's news editors last month: —

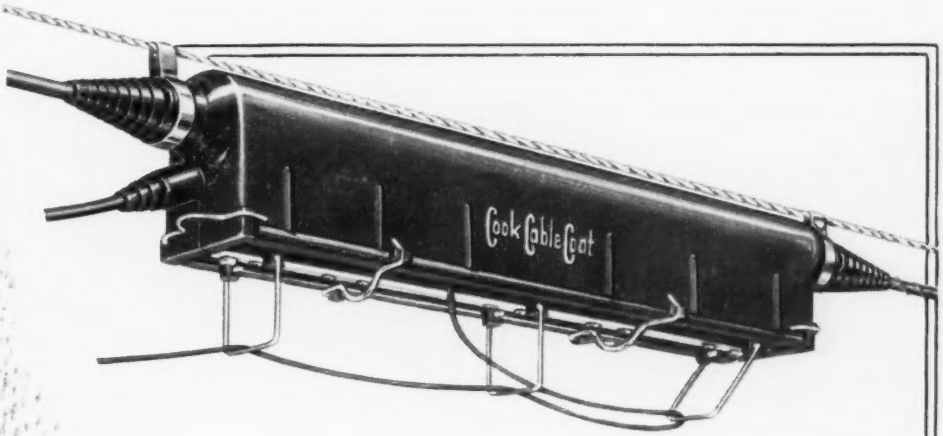
CAPITAL CITY TELEPHONE

As exclusive as an

ALL IN ONE in a SABLE COAT

Cook now furnishes

ALL IN ONE in a CABLE COAT



with:

1. Splice maker
2. Cable Taps
3. Unitized subscriber line blocks
4. Optional protection
5. Test points
6. Wye splice nozzle

"All in one" messenger mounted

Pole Cable Terminal

DESIGNED FOR INDEPENDENT TELEPHONE INSTALLATION

See Your Telephone Equipment Supply House

COOK ELECTRIC Company

Since 1897

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*KLEIN KUT PLIERS

for both regular and heavy-duty cutting

It was Klein that produced the first and still the finest regular side-cutting plier. Klein also gave the industry the modern, streamlined version so much in demand.

And it's Klein again with a new, high leverage cutting plier for light- or heavy-gauge wire, including No. 2 weatherproof hard drawn solid copper wire, and A.C.S.R.

There's no extra hinging of any kind—no uncomfortable wide-spread handles—with this new Klein-Kut Plier. The offset hinge permits the extra-high leverage and operation is as smooth and easy as with any other Klein Plier. Forged from high-grade tool steel, individually fitted, tempered, adjusted and tested. Ask for No. 213-9 N.E. for streamlined pattern.

Regular pattern available

Same high-leverage design, but in the original Klein side-cutting pattern. Ask for No. 213-9.

Write for free Copy of Bulletin 1054

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Foreign Distributor: International Standard Electric Corp., New York.

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Co., Jefferson City, Mo., reported — "Station gain breaks all-time record for 3rd consecutive year." Foster B. McHenry, Capital City Tel. Co., president said the highest previous station gain in the history of the company was exceeded for the third straight year with 765 telephones added in 1957. As of November 30, 1957, 65 stations were needed to equal the 1956 station gain. As a result of an all-out sales effort by commercial and plant, 99 telephones were added during December, to exceed 1956's gain by 24 stations. The net gain of 765 stations represented 71 business main stations, 184, business extensions, 262 residence extensions . . . ."

LUCIUS R. ROWE, president of Southern New England Telephone Co., reported the "softening economy which became evident in the final months of 1957" slowed telephone gains in the last quarter of '57.

"For the year 1957," Rowe said, "telephones in service increased by about 53,000 and we handled 6½ percent more out-of-town calls than during 1956. Results for the first nine months held up well, but during the last quarter of the year we gained only half as many telephones as in the same period of 1956, and the increase in out-of-town calling was just 5 percent over the previous year . . ."

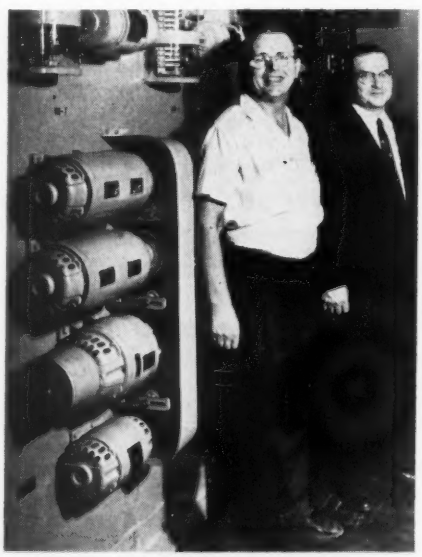
Rowe reported that although total expansion has slowed down," it has by no means stopped. To keep up with service requirements, Southern New England has planned a construction program for 1958 which will be only slightly lower than for 1957."

MOUNTAIN STATES TEL. & TEL. CO., expects in 1958 to match its 1957 construction bill of $110,000,000 in carrying out its expansion and improvement program, President Walter K. Koch said in a year-end statement. Last year, the company added more than 132,000 telephones to bring the total number in service to 1,938,000, while its dial conversion program brought dial-operated service to 89% of the company's telephones.

Telephone Personalities In The News

Newman Succeeds Smith at REA

LAST MONTH William W. Newman, Jr., a graduate of Alabama Polytechnic Institute, moved into his new post as assistant chief of the staff engineering group in REA's telephone engineering division, succeeding Warner T. Smith, who has resigned to accept a position in private industry. Newman joined REA in 1949; left in 1953 to manage a REA-financed telephone company; rejoined REA in 1955.



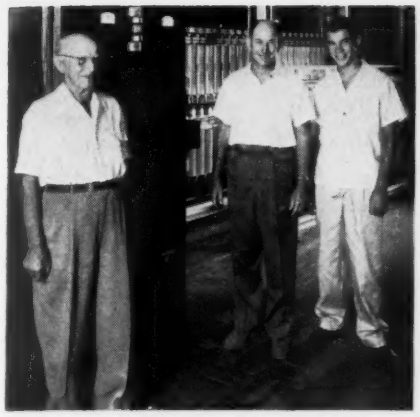
BEAMING APPROVAL at completion of installation of new dial equipment at Cathedral City, Calif., are California Water & Tel. Company's JACK W. THOMAS (left), who was in charge of the installation, and R. D. DAVIS, manager of the Palm Spring Exchange.

New P. R. Directors

ON MARCH 1 two industry members advanced to new positions as public relations directors: Robert J. Wachter joined General Telephone Co., of the Southeast, and will headquarter at Durham, N. C.; Robert F. Williams will take over the P. R. post with General Telephone Co., of the Northwest.

New Commercial Director

W. J. HAMM, vice president of General Telephone Co., of Michigan, on February 15 took over as commercial director in the operations department of General Telephone Service Corp., New York City. He



THREE GENERATIONS of Newmans take part in cutover to direct distance dialing at the Coachella Valley Tel. Co., Indio, Calif. J. W. NEWMAN (center), manager, and grandson MICHAEL NEWMAN (right).

succeeded D. E. LaMaster who has been assigned to assist R. Parker Sullivan, vice president, merchandising.

Henry W. DeWitt

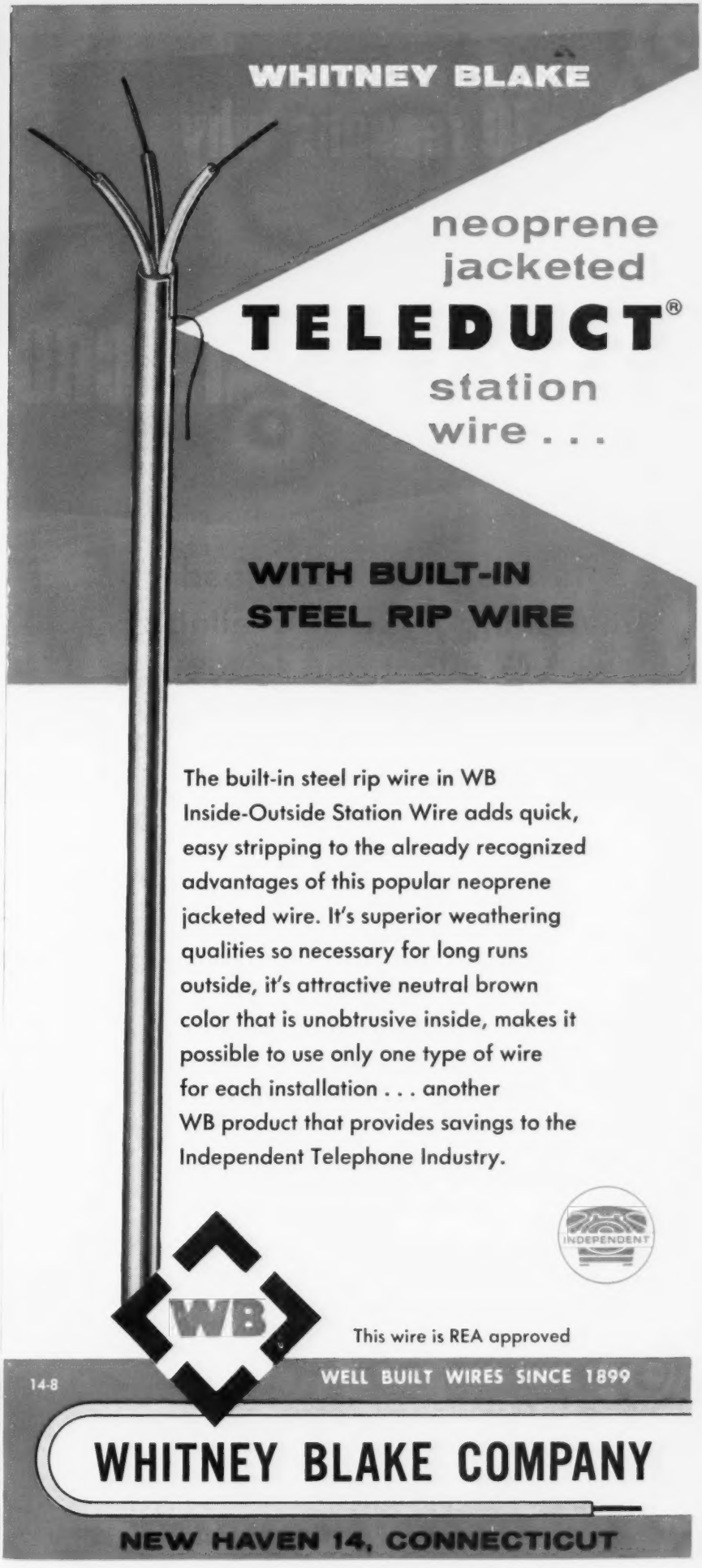
HENRY W. DeWITT, staff engineer in the American Telephone & Telegraph Co., operation and engineering department, became an assistant vice president of the New York Telephone Co., Feb. 1. DeWitt reports to Karl T. Dutschmann, vice president-operating staff of New York Telephone. He joined the Bell System in 1927 as a student engineer with the New York company. He joined the AT&T in 1942, and has served in such assignments as inventory and cost engineer and building & equipment engineer.

Changes at New Brunswick

NEW BRUNSWICK TEL. Co., Ltd. has announced that J. L. Holman, general manager, has retired from active service with the company due to ill health.

Other organization changes are: W. J. H. Seely, general traffic manager appointed general personnel manager; G. W. Green, general commercial manager, appointed general traffic manager, G. W. O'Blenis, general personnel supervisor, appointed general commercial manager. Officials formerly reporting to the general manager will now report to the president.

Holman joined the company in 1924 in the traffic department at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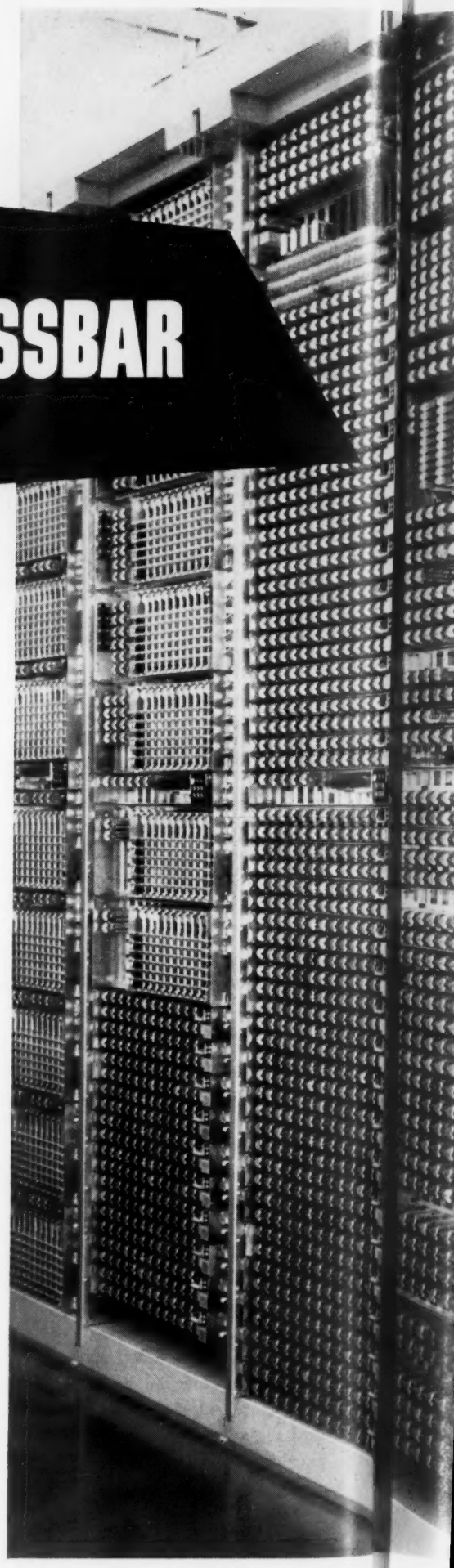
neoprene
jacketed
TELEDUCT®
station
wire . . .
WITH BUILT-IN
STEEL RIP WIRE
The built-in steel rip wire in WB Inside-Outside Station Wire adds quick, easy stripping to the already recognized advantages of this popular neoprene jacketed wire. It's superior weathering qualities so necessary for long runs outside, it's attractive neutral brown color that is unobtrusive inside, makes it possible to use only one type of wire for each installation . . . another WB product that provides savings to the Independent Telephone Industry.
INDEPENDENT
WB
This wire is REA approved
14-8
WELL BUILT WIRES SINCE 1899
WHITNEY BLAKE COMPANY
NEW HAVEN 14, CONNECTICUT

10 reasons why

NORTH BY-PATH CROSSBAR

is the most advanced switching system available to the telephone industry...



1. Can search over as many as 80 trunks on any call, assuring a high degree of trunk availability.
2. Can route calls on a "2-5" basis without use of inter-toll directing codes.
3. Can "spill forward" as many of the "2-5" digits as necessary. Alternate routing can be provided wherever desired without additional equipment.
4. Any directory number can be assigned for coin service, measured service, PBX trunks or normal flat rate service.
5. All unassigned numbers and unidentified codes are automatically intercepted by tape recording. Directory numbers for which a referral message must be given are automatically routed to the operator.
6. A single switching train accommodates toll calls and test calls, providing features appropriate to each type of call.
7. All senders arranged to send digital information by means of dial pulses at 10 or 20 pulses per second or multi-frequency at 7 digits per second, according to trunk requirements.
8. The above types of digital information may be transmitted over any incoming trunk.
9. All the routing and handling equipment for Direct Distance Dialing is part of the standard Central Office Equipment.
10. Reduces requirements for toll board multiples by using a universal toll switching trunk group permitting standardized operating procedures for toll call placement requiring minimum reference to routing bulletins, substantially reducing operator's time and cost.

All these features are standard in North By-Path Crossbar switching equipment. If you are planning on new switching equipment, you'll need North By-Path Crossbar.

Photo: Mansfield Tel. Co.

NORTH ELECTRIC COMPANY

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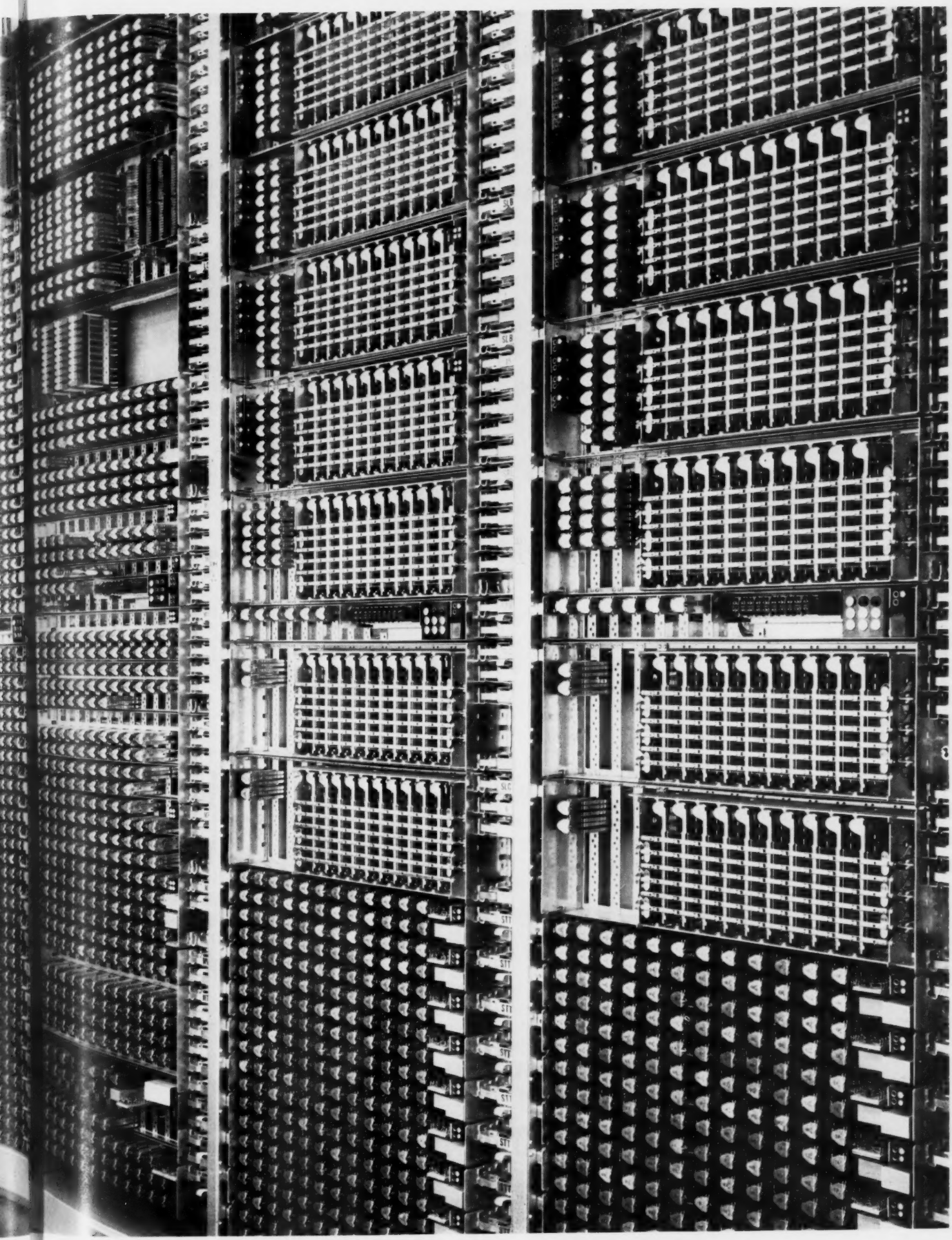

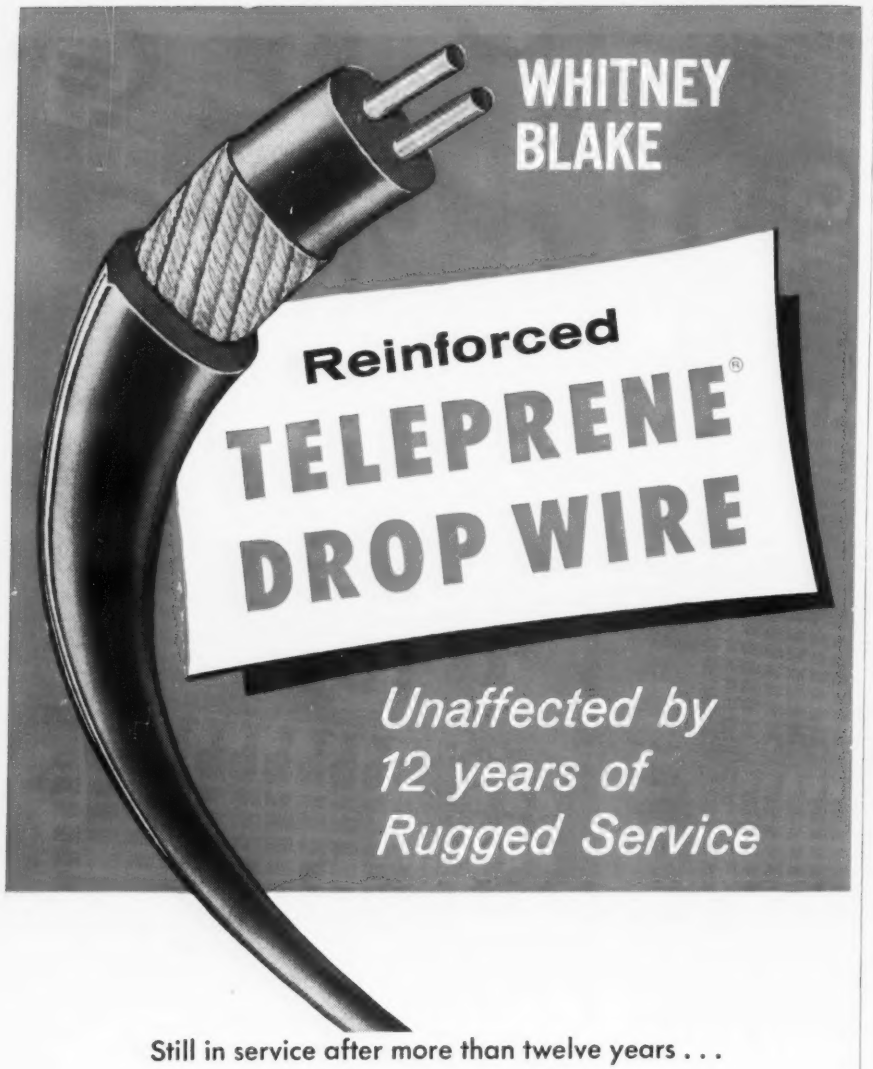

Still in service after more than twelve years . . . that's the exceptional record of WB Reinforced TELEPRENE Drop Wire . . . and there's only one reason . . . quality. By cutting drop wire replacement to the bone with Reinforced TELEPRENE, Whitney Blake has proved that even if you could get drop wire for nothing, unless it stands up as long as WB TELEPRENE, service calls and replacements would cost you more.

INDEPENDENT

WB

This wire is REA approved

1-8 WELL BUILT WIRES SINCE 1899

WHITNEY BLAKE COMPANY

NEW HAVEN 14, CONNECTICUT

(Concluded from page 29)

Saint John and served progressively as general traffic manager, general personnel manager and since 1952 as general manager. He was appointed a director of the company in 1955. Holman is president of the Telephone Association of Canada, a member of the Senate of the University of New Brunswick and a director of the Saint John Exhibition Association.

Seely joined the company in June 1919. He was appointed general traffic manager in February 1952.

Green entered the company's employ in May 1924 and was appointed general commercial manager in February 1952.

O'Blenis joined the company in February 1946. He was named general personnel supervisor in 1956.

No. Carolina Groups Settle Service Boundary Dispute

THE NORTH CAROLINA Utilities Commission and the State Rural Electrification Authority have settled a wrangle over service boundaries of rural telephone cooperatives.

A formal agreement was announced last month by Commission Chairman Stanley Winborne and REA Chairman Gwyn B. Price. The agreement followed lines laid out several weeks ago at a conference of the two state agencies.

Leaders of telephone co-ops had raised a storm of protest to orders of the commission directing a commercial telephone company to serve customers in areas claimed as co-op territory. Gov. Hodges had urged the two agencies to get together and settle the matter.

Under the agreement, the REA in the future will notify the commission before giving final approval for the formation of telephone co-ops. This will give the commission opportunity to investigate the possibility of requiring a commercial company to serve the proposed area.

The agreement also provides a measure of assurance to co-ops that boundary lines of their service areas will be recognized by the commission. It also sets up a procedure for determining whether customers in fringe areas will be served by the co-op or a commercial company.

Microwave comes to Dallas on a Blaw-Knox Tower

Building in a crowded downtown location required a special self-supporting tower. This Blaw-Knox tower was built to withstand high winds common to the area.

Designed for future expansion, this 250 foot tower is equipped with ring mounts that permit precision orientation . . . allow additional dishes to be installed with less work and less cost.

Keeping pace with the times, the General Telephone Company of the Southwest turns to microwave to extend service, simplify future growth and lower circuit costs. In bringing microwave service to 16,000 of its 250,000 telephones, this progressive company relies on Blaw-Knox towers.

From Texas to North Carolina, from Florida to Ohio, these efficient microwave towers are paying off in the nation's most modern communication systems. Backed by over 40 years of tower experience, Blaw-Knox designs to *established* specifications, builds to meet *individual* requirements. By consulting skilled Blaw-Knox engineers you are assured of towers that best meet your present needs and can allow for future expansion.

Blaw-Knox's Microwave Tower Booklet covers the outstanding operating advantages of microwave, and outlines a complete service that ranges from tower design through fabrication and erection. Write for Booklet 2538 today.

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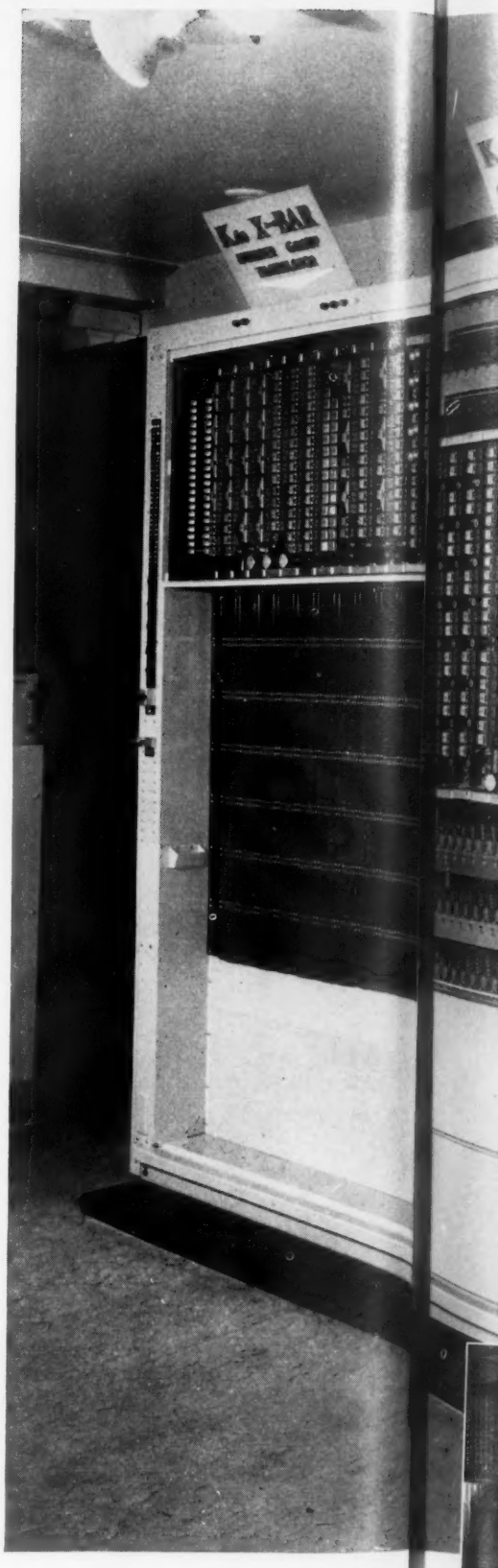

The REALLY BIG Advance in CROSSBAR SWITCHING!

"Star" of the U.S.I.T.A. Convention was the new K-60 Crossbar Switching System—the biggest advance in automatic switching for independent telephony. This new Kellogg development offers *full terminal-per-station efficiency with terminal-per-line type of equipment.* And, it can be engineered for any size system from small community dial offices to large metropolitan exchanges with maximum operational savings.

The efficiency of the new K-60 is achieved through the use of registers and full-station translator bays. The registers completely control dial selections on a stage-by-stage basis and accept up to 14 digits for nation-wide toll dialing. In the translators, subscriber assignments are made by inserting rectifiers in a matrix associated with each telephone number, thus eliminating major soldering changes on the main frame.

SOME OF THE EXCLUSIVE K-60 FEATURES

- **Conversation timing by 10-line groups.**
- **Conversation timing on revertive calls.**
- **Any telephone arrangeable for joint party release, thus permitting the tracing of malicious calls.**
- **Detects trouble—locks trouble-path and blocks from future calls until correction is made.**
- **Simplified main distributing frame utilizing a 2-conductor jumper per line.**
- **100% Intercept facilities.**
- **PBX groups may be spread over entire office—eliminating need for high traffic connector group.**
- **No charge assignment on specific lines such as Police and Fire.**
- **Toll access restriction by 10-line groups.**

Call your Kellogg representative and let him show you how these and the many other features of the new K-60 Crossbar Switching System can bring new and better service to your subscribers at the minimum cost.

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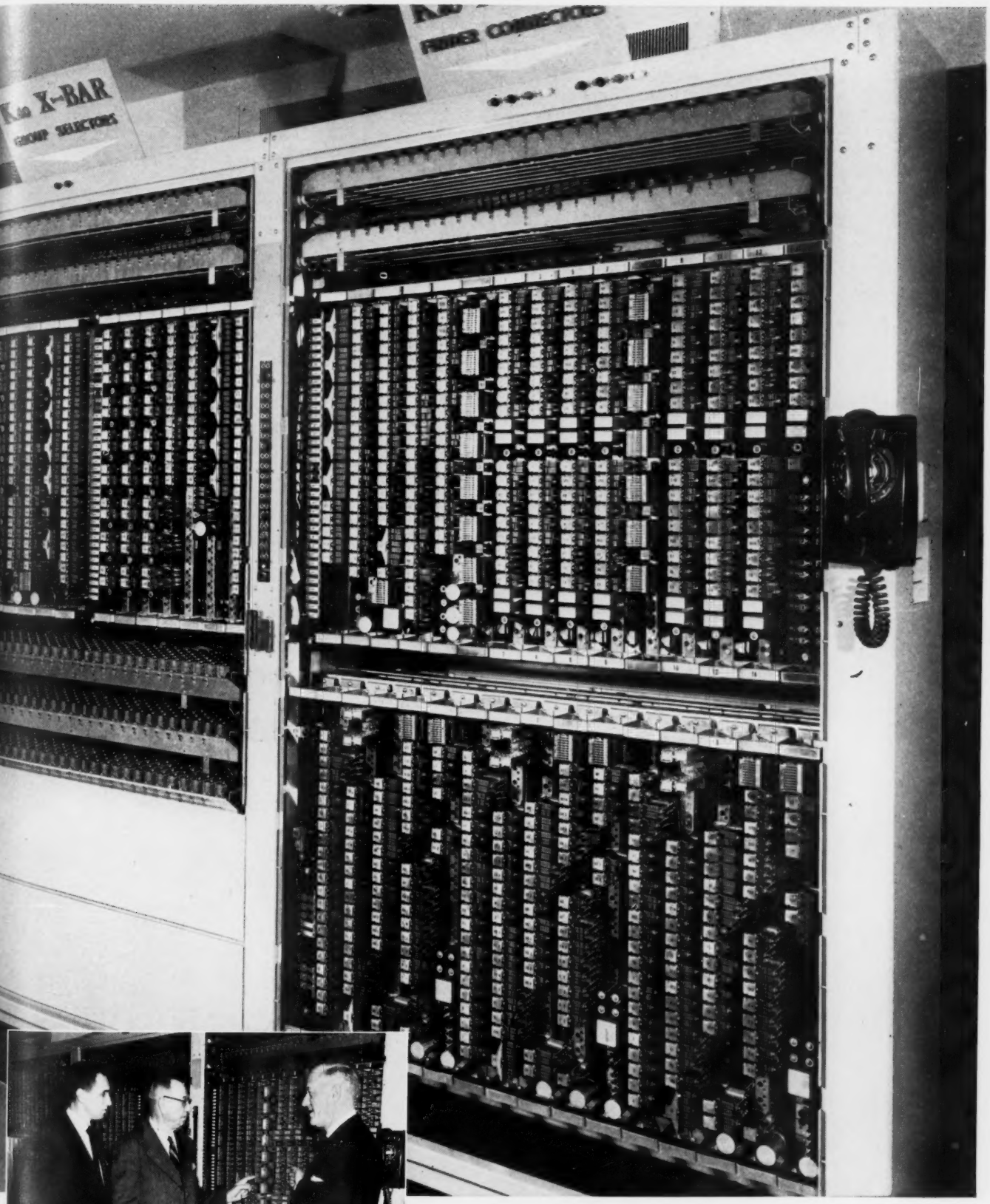
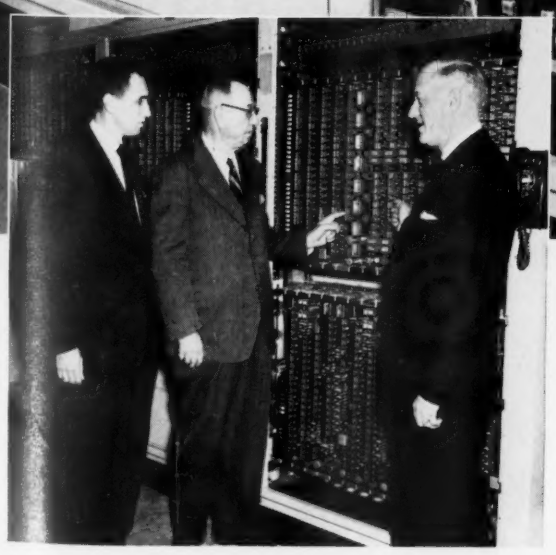
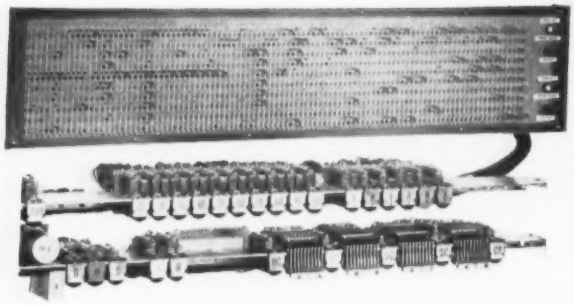




The K-60 Crossbar Switching System was introduced in this display at the U.S.I.T.A. Convention. This new unit reduces floor space requirements of previous crossbar equipment by 30%.

Among many distinguished visitors expressing interest in the new K-60 was Mr. S. A. "Gus" Lane, President of the Western Arkansas Telephone Company, Russellville, Arkansas. Mr. Lane (center) was shown the systems' many outstanding features by G. T. Scharffenberger (left), President, and W. P. Hollis, Vice President, of Kellogg Switchboard and Supply Company.

NOW AVAILABLE *at nominal cost*



Sectional View of Computer Intercept Unit for 100 Line TPL or 1,000 Station TPS Installation.

Advanced technique of printed circuity is used in this equipment. The Magnetic Impulse Counter is the basic unit of the computer register circuits, supported by standard telephone relay apparatus of recognized manufacture.

Other UNIVERSAL Telephone Equipment:
DIGIT ABSORBER for 2-5 Numbering
Code-to-Selective RINGING CONVERTER

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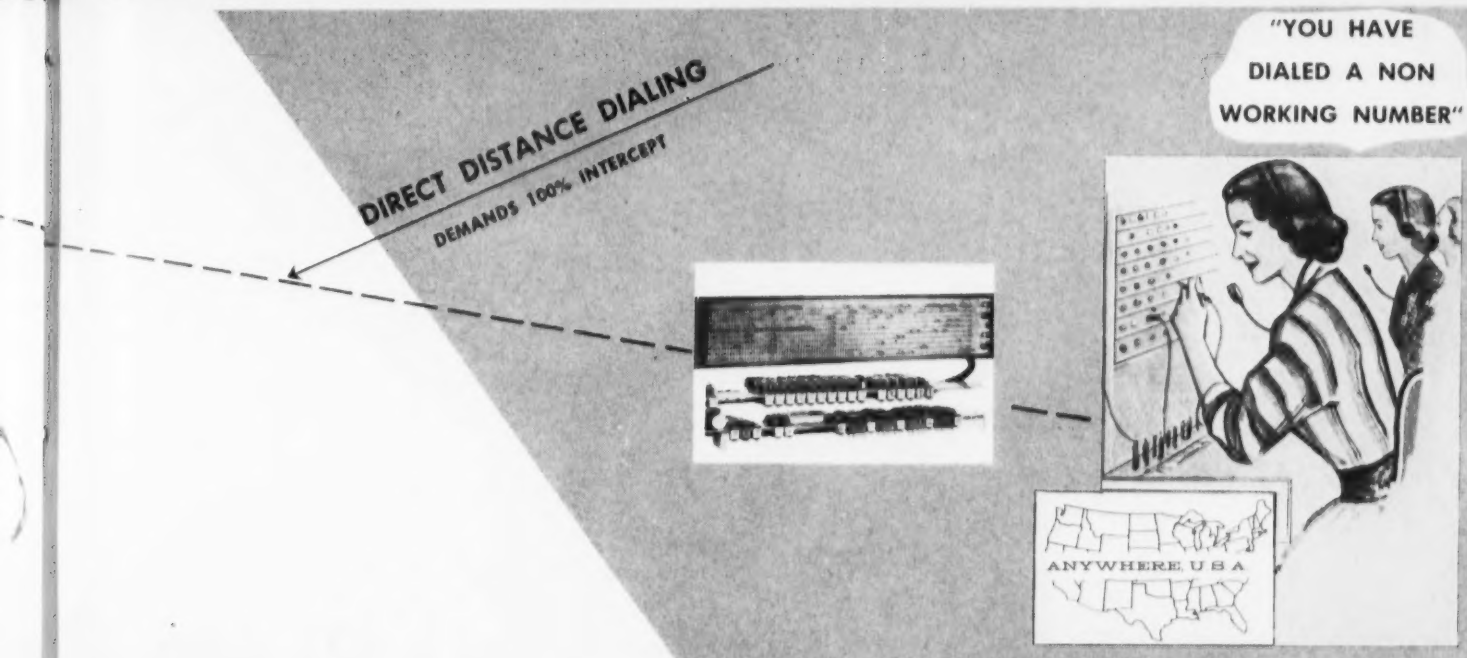
UNIVERSAL 100% COMPUTER INTERCEPT



Buy the ultimate requirements in intercept equipment. Not "merely adequate" . . . not 20% . . . not 99% . . . but 100% intercept is the ultimate requirement for direct distance dialing. Universal Computer Intercept offers 100% intercept at nominal cost, compatible with any make switchboard, and easily inserted anywhere in the dialing train. The unit is completely factory wired and may be installed by regular maintenance personnel. Simplicity of design lends to minimum maintenance requirements.

CHECK THESE ADDITIONAL BENEFITS OF UNIVERSAL COMPUTER INTERCEPT

- ✓ **Increase Schedule A Commissions.**
  Your TPL will have the effective features of TPS intercept *to add to* your toll settlement.
- ✓ **Increased Revenue through Increased Trunk Usage Time.**
  Reduce the repeated attempts on long-haul toll calls that keep valuable toll switching apparatus tied up.
- ✓ **Savings in Time and Material in Adding Intercept Service to your Operation.**
- ✓ **Intangible Advantages.**
  - Immediate intercept of calls to busy lines for non-working or changed numbers on these lines.
  - Intercept of incoming toll calls by request of customer or commercial department.
  - Many others of commercial value.

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MAIL ADDRESS – P. O. BOX 13122, DALLAS 20, TEXAS

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23 BRODERICK ROAD BURLINGAME, CALIF	1594 SOUTHLAND CIRCLE, N. W. ATLANTA, GA
6100 EXCELSIOR BLVD MINNEAPOLIS 16, MINN	165 PROSPECT STREET PASSAIC, N. J.

MAIL THIS COUPON TO THE NEAREST ADDRESS

Gentlemen: I am interested in your Universal COMPUTER INTERCEPT.

NAME_____

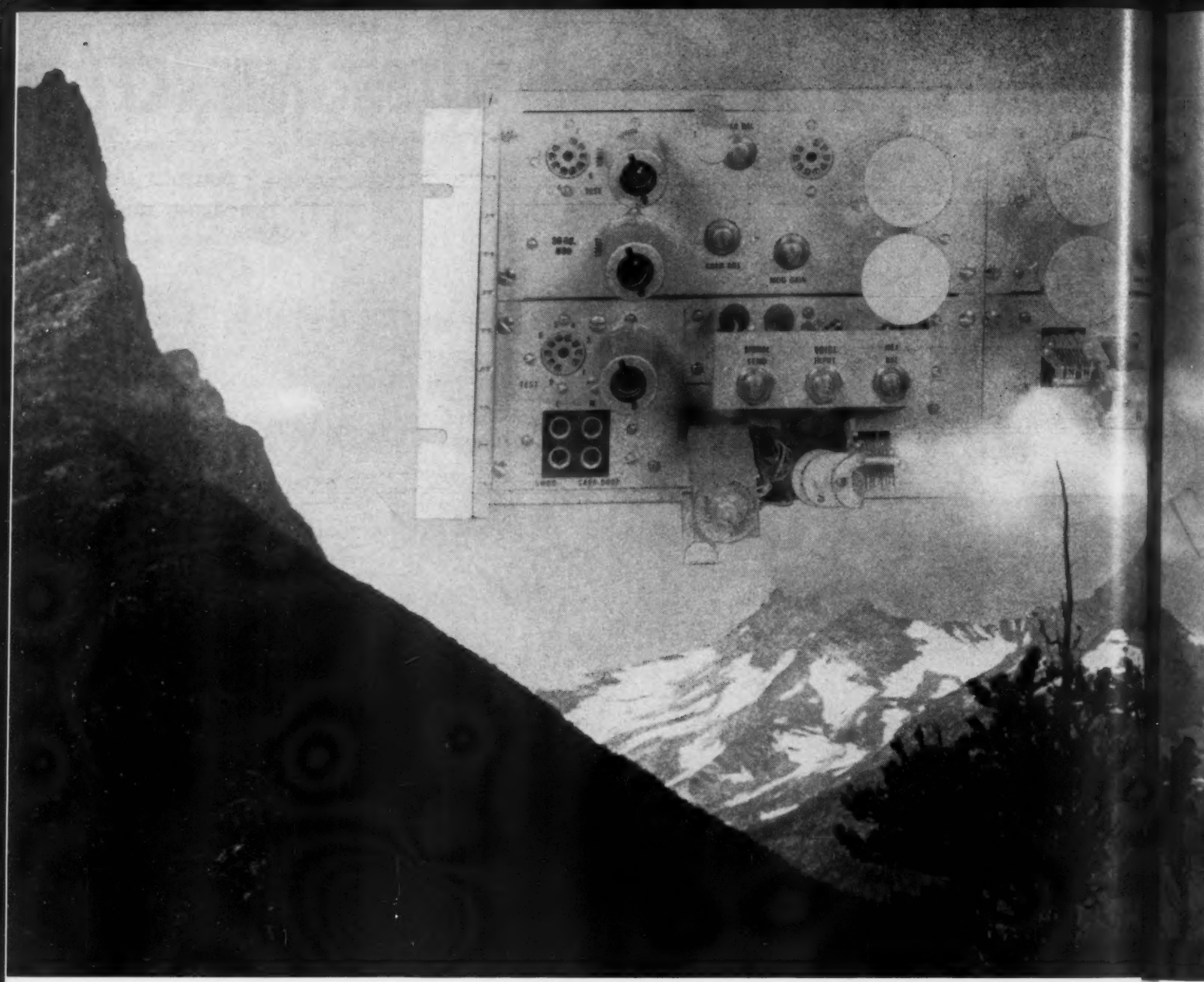
POSITION_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____

E2-15



● TOLL QUALITY PLUS...When you buy a Stromberg-Carlson microwave system, you get toll quality built to common carrier requirements -- plus these extra advantages: you can add channels at intermediate points with much less equipment than other makes; convert to dial signaling or from 2-wire to 4-wire operation by simple wire strapping on terminal boards; get up to

170 channels in a system; add supervisory tone and telegraph channels without affecting voice channel capacity. Crystal oscillator control assures channel stability. For full technical details contact your Stromberg-Carlson representative.

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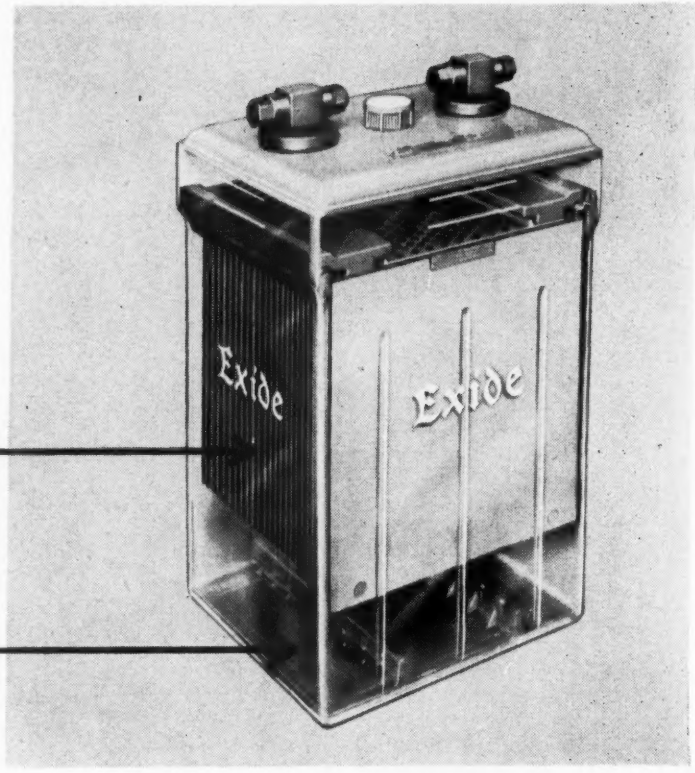
ELECTRONIC AND COMMUNICATION PRODUCTS FOR HOME, INDUSTRY AND DEFENSE

Have You Seen the New Exide-Tytex Battery?

Three important design features for longer life, greater economy, and superior performance



1 Suspended plates Instead of resting on the bottom of the jar, plates are suspended from ledges molded into the jar walls. This means new freedom from cover leaks and sediment shorts—hence longer life and more dependable performance.

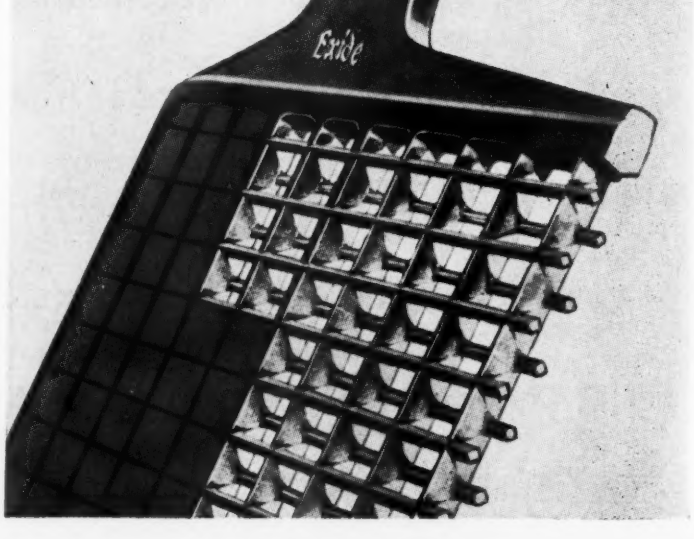
2 Plastic jar Not just any kind of plastic, but a special one proved chemically stable and impact resistant. Saves weight and space.

You may know the Exide-Tytex as a superior pasted plate battery. Now Exide has made it even better. Now you get top battery economy with minimum investment, plus even greater battery life potential and dependability.

Look at the new improvements: suspended plates, plastic jar, Silvium grids. And, of course, it has the same powerful active material and quality construction standard in Exide batteries. Among pasted plate telephone batteries, the Exide-Tytex can't be matched. This is Exide's way of insuring that for every application, you continue to get the best value possible in batteries with the Exide brand.

Exide batteries for telephone service are available in calcium alloy types in a range of sizes from 50 to 1680 amp-hr capacity.

3 Silvium grids Exide's patented grid alloy. Up to 100% more corrosion resistant than commonly used alloys. Prolongs battery life. Silvium can be used only in Exide batteries.



Exide®

"Telephone Bills Could Be 10% Lower If . . ."

EACH TIME we refer to our file on "Excise Taxes" we are reminded that excise taxes on telephone services have acquired a suspiciously permanent look.

This "always-going-to-be-around" appearance came out in the open a few weeks ago when the Joint Federal-State Action Committee proposed that 40% of the local telephone tax be turned over to the States in order to provide funds for certain functions now handled by the Federal Government and to be assumed by the states.

To many telephone industry members this proposal plainly proved that many people in many high places have forgotten three things: (1) *That the local telephone tax was a war-time emergency tax — a so-called 'temporary tax' to be imposed only for the duration of the emergency;* (2) *that no excise tax was imposed on telephone service until World War II came along;* and (3) *that the proposal of the Committee would have the effect of making the tax on local telephone services a permanent part of the tax structure of state governments.*

It seems to us, the nation's telephone subscribers have carried the burden of telephone excise taxes long enough. Twelve years have passed since the end of World War II but telephone subscribers are still paying the excise taxes imposed on communications as a temporary measure during that conflict.

We believe industry members and their association committees have done, and are doing, an excellent job of pointing out the discriminatory features of the telephone excise tax and urging its early repeal. We well know from clippings reaching our desk that several Congressmen now regard the telephone excise tax as an evil that can and should be eliminated.

This change in thinking is all too the good. But industry representatives and association committees can go only so far. The real power, the power that can force the issue in Washington, lies in the hands of the nation's 63,000,000 telephone subscribers. Somehow they must be inspired to tell their Congressmen in their own words that "*one of the most practical ways of affording the average citizen some measure of tax relief is by repealing the 10% telephone excise tax. . . .*"

We believe the time is ripe for inspiring the nation's telephone subscribers to do just that.

Washington observers say "*You see the pressure for tax reduction in mail to Congressmen and this being an election year when every member of the House and a third of the Senate will be up for reelection the Congressmen are paying attention to the mail from home . . .*"

There are other factors: The main one builds itself around the fact that *tax relief for individuals will give the individuals more money to spend and consumer spending is just the tonic business needs right now.*

That's why we believe all telephone companies should strongly urge their subscribers to write their Congressmen and request them to support legislation aimed at repealing the discriminatory excise tax on telephone services.

As we said before Congressmen are listening, reading, and doing something about the mail they receive from home. But before they do some serious thinking about repealing the excise tax on telephone service *they must hear from many of the folks at home.*

We believe they will hear if you get busy and impress upon your subscribers the fact that "*Telephone bills could be 10% lower if the excise tax on telephone service is repealed at this session of Congress.*"

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Generations of Roebling telephone cable and wire experience are wrapped up in these two fact books! If you use paper-lead or plastic telephone cable in aerial, duct or direct burial installations, you need all these facts at your finger tips. Beside manufacturing, size and test data, both books contain useful installation and splicing hints, helpful tables, scores of illustrations! Worth a three-cent stamp to add these valuable books to your technical library: Yes, *sir!* Just clip the coupon to your letterhead and mail today. Electrical Wire Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

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Mobile Radiotelephone service subscriber uses new pushbutton dial radiotelephone to place a call. This new equipment, now in use by the Central Virginia Telephone Co., can be used with automatic dial exchange, eliminating need for radiotelephone service operator. Pushbutton dialing reduces chance of error in mobile use.

MOBILE RADIO TELEPHONE SYSTEMS

Dial operated radio equipment economically provides 24-hour radiotelephone service to mobile and rural subscribers.

By GEORGE E. DODRILL*

SEVERAL years ago REA realized that since dial exchanges are used by most REA borrowers (and very seldom do they operate a toll board where operators are used), the only kind of mobile service that could be offered to the public would be either a dispatch type or an automatic dial-operated type.

In the dispatch type of service, employes handle calls to and from mobile vehicles during regular office hours. While this type of service is limited in value to the general public, it is valuable to a telephone company for use in the maintenance and operation of its system.

Under present FCC rules and regulations, frequencies are not available solely for use in the maintenance and operation of a telephone system. However, channels which are allocated for common carrier mobile service may be used by a telephone company for its own use if a public offering is made to provide mobile service to those in the area who desire it. A dispatch type of service will meet this requirement.

The dispatch type of operation is more valuable to the telephone company for its own use if the base station equipment is so arranged that the received signal can be re-transmitted when desired. This would permit mobile units to communicate with each other without having someone at the office at night to repeat orally all messages between the mobile units. Thus, two mobile units can communicate with each other as long as both are within radio range of the base station. The base station in this case is operating as a mobile relay station.

For a telephone company that has dial exchanges but no switchboard operators, dial operated radio equipment is the only economical method of providing 24-

**Mr. Dodrill is an engineer with the Rural Electrification Administration, Washington, D. C. He presented this paper at the 1957 convention of the Virginia Independent Telephone Association.*

hour radiotelephone service to mobile and rural subscribers. Dial operated mobile equipment may be used to provide radiotelephone subscriber service in vehicles. It may be used to provide radiotelephone service to residences, ranches, and resorts in remote locations where construction of wire line facilities is impractical Dial radiotelephone equipment may also be used in a telephone company's own vehicles for use in the construction and maintenance of its facilities.

Mobile Dial Radio Equipment

FOR SEVERAL years REA tried to interest radio manufacturers in designing and manufacturing mobile dial radio equipment. The manufacturers could not be convinced at that time that there was a market large enough for them to design and manufacture this type of telephone equipment.

New pushbutton dial radiotelephone for automatic exchanges is used by home subscriber. Such equipment, now in use by Central Virginia Telephone Co. can profitably be used in fixed stations where scattered population would prohibit regular wire line telephone service.

In May 1956 specifications were written and telephone and radio manufacturing companies were invited to submit bids on furnishing two mobile radiotelephone units, one rural subscriber station, and one base station with the associated antennas and coaxial cable transmission lines. Bids from the Automatic Electric Co. and Motorola, Inc., were accepted.

The Central Virginia Telephone Corp., Amherst, Va., was selected as the site for installation of the Motorola equipment. This equipment was installed in May, 1957. The Automatic Electric equipment was installed in July, 1957, in the Branford Exchange of the North Florida Telephone Co., Live Oak, Fla.

The specifications were written so that commercially available base and mobile radio equipment would be used as far as possible in the dial operated radio equipment. In other words, the equipment to be developed was to be more or less applique equipment which would go between the standard radio equipment and the telephone equipment.

The equipment designed by both companies is for single channel, two-frequency operation with push-to-talk in the mobile units. The equipment operates in the 152-162 mc band. The power output of the base station and one mobile unit is 60 watts. The second mobile unit and the rural subscriber station has a power output of 25 watts. The dialing and supervisory signals are such that they are received as conventional signals by the telephone exchange switching equipment.

With the Motorola equipment three tones are transmitted by the mobile stations for each digit. A push button control head is used. The tones are sent in a sequential order when a button is pushed. Two out of four tones are transmitted to represent a digit and a fifth tone is used as an interdigital tone.

The tones are generated from a single transistor in the control head. When the three tones are received by the base station, they are translated into the required number of dial pulses. These tones are of long duration (100 to 200 milliseconds) long enough so that if dialing is done in a weak-signal area, loss of a tone from flutter of the signal due to reflection from trees, etc., will be less likely to occur. However, if a tone is not registered, no digit will be passed to the exchange. The result will be a partially dialed number rather than a wrong number.

With the Automatic Electric equipment a standard rotating telephone dial is used on the control head of the subscriber sets. A 2000-cycle gate tone is transmitted when the dial is moved off normal. This tone operates a slow release relay in the base station which removes a short from across a line pulse relay. A 1500-cycle tone is pulsed as the dial returns to normal. When this pulsed tone is received by the base station, it is converted to d-c pulses which select the called land-line subscriber.

Designed to Serve 10 *Subscribers*

THE INITIAL equipment of both makes is designed to handle 10 subscribers on a full selective calling multiparty basis from a line circuit in the exchange. In other words, this subscriber service is very similar to that on any multi-party line. The base station equipment of either company can be modified to handle 20 or more subscribers by using an additional line circuit of the exchange for each additional ten parties.

Either make permits a telephone wire line subscriber to dial any mobile subscriber within range of the base station. Likewise, a mobile subscriber can dial any wire line subscriber without the aid of an operator (except for toll calls). Any type of call such as revertive calls, long distance dialing, etc., which can be made by wire line subscribers can likewise be made by the mobile telephone subscribers.

When a call is made from a wire line station to a mobile unit, the base station detects the side of line and ring code of the mobile unit being called and sends out two tones which ring a bell or buzzer in the desired called mobile unit. When the radio circuit is in use a busy light will be lit in all mobile units. If the circuit is in use, provision is made so that in an emergency a second mobile unit can break in and request the use of the circuit.

Both systems are "fail safe" systems i.e., after completion of a call, if the station is not taken off the air by disconnect signals from either the telephone or mobile unit, the base station timer will take the base station off the air. For example — in a mobile subscriber-initiated call, if the vehicle traveled beyond radio range of the base station and its disconnect tones were not received by the base station when the handset was hung up, the timer would remove the base station from the air.

The equipment which was installed in Amherst and Branford has been in operation for several months. In general, both makes of equipment were well designed and the number of "bugs" one expects in new equipment has been surprisingly low.

While the Automatic Electric Co. has not yet announced the prices of its equipment, Motorola, Inc., has announced its prices. The mobile unit will cost approximately $925 and the base station approximately $3,500, plus installation.

In addition to Motorola and Automatic Electric, mobile dial radio equipment will soon be available from the Dumont Manufacturing Co. and probably from the General Electric Co. Dumont prices are about $725 per mobile unit and $4,500 for the base station. When these companies have equipment available, REA expects to field test the equipment in a borrower's telephone system.

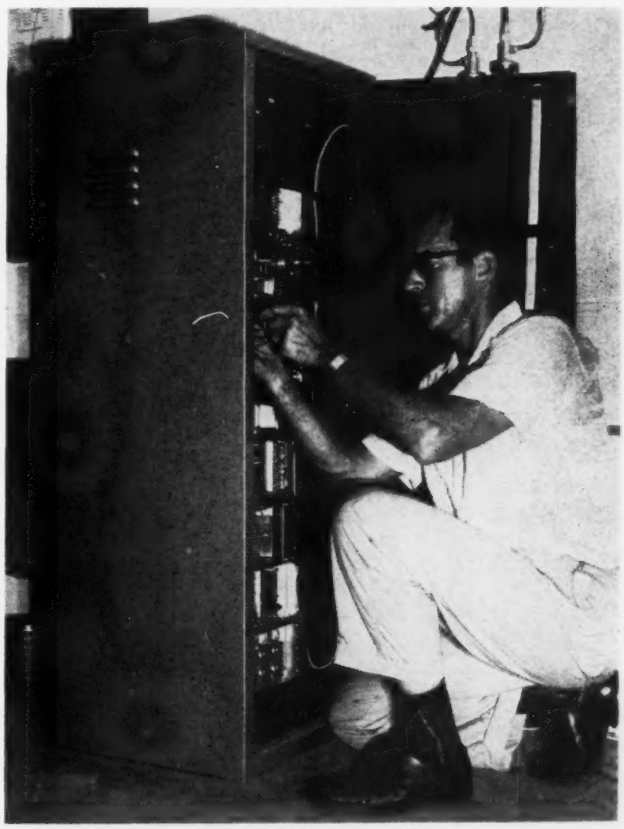
FCC Regulations

BEFORE a radio station can be installed it is necessary to file an application with the Federal Communications Commission for a construction permit. This application should be filed on FCC Form 401. The rules and regulations are outlined in Part 21 of the FCC rules which may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for 20 cents a copy. After a station is installed and in operation FCC Form 403 should be filed for the station license.

There are presently six radio channels available to a telephone company for mobile use in the 152-162 mc band. This band, in general, is best for mobile use in rural areas. Two frequencies are used for each channel, one for transmitting and the other for receiving. The separation of frequencies in each channel is 5 mc.

The applicant should apply for a radio channel which is not in use in the area. It may be desirable to use the same channel that is used in an adjacent area. However, the base stations should not be closer than 75 or 100 miles, depending on terrain, so that there will be no overlapping of the areas. This will prevent the mobile units being received by the base stations of both systems. If a particular subscriber desires to operate in other areas where different channels are in use, mobile units may be obtained which can operate on more than one channel.

Subscribers using dial operated mobile units may place calls when in areas of other systems that use mobile operators, such as Bell Companies. The mobile operator will answer as soon as a mobile unit turns on its transmitter. This assumes operation on the same channel. Credit cards should be issued to mobile subscribers so calls can be made with a minimum of difficulty in territories of foreign companies. A mobile unit cannot be called unless the operator has a code-sending device which is compatible with the receiving selector in the mobile unit.



The author, GEORGE E. DODRILL, Rural Electrification Administration engineer, is shown making minor adjustments on equipment at Central Virginia Telephone Co. office. Equipment is base station for company's new radiotelephone system that permits direct dialing to automatic dial exchanges by radiotelephone mobile and fixed subscribers, eliminating need for operator.

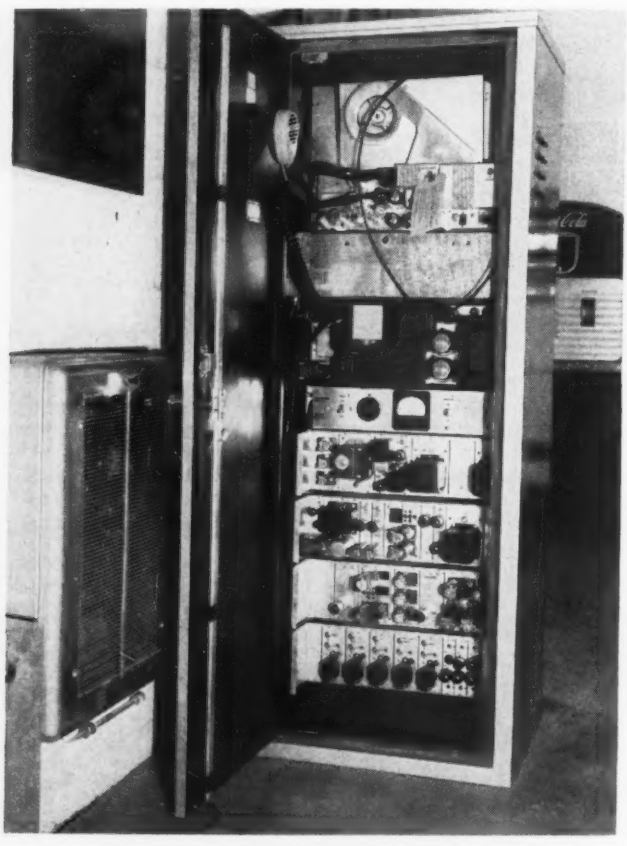
It is possible to add the necessary selector equipment in the dial operated mobile units so that those mobile units can be called by a Bell mobile operator. However, we believe that most mobile subscribers using dial radiotelephone equipment would be satisfied with being able to place calls when within radio range of Bell mobile radio systems. If additional Bell selector equipment were installed in the same mobile units so

that a Bell operator could call them, the rates for those mobile units would have to be considerably higher.

Part 21 of the FCC rules requires that an operating log be kept on the calls by an operator at a control point. When an application is filed for a dial system, a request for a waiver should be made to eliminate the requirement that an operator be kept at a control point and that an operating log be kept.

The FCC rules also require all stations to identify themselves by voice or tone. The base station automatically identifies itself with tone in Morse Code or by voice on tape. Since all mobile and rural subscriber radio transmissions are retransmitted by the base station and thus identified with the associated base station, it would be desirable to request a waiver from the FCC to eliminate the necessity for mobile and rural subscriber stations to identify themselves individually at the end of each transmission.

When filing for a construction permit for a mobile radio installation, we suggest that an application be filed for approximately 5 stations for operation at temporary fixed locations. Such a blanket license would authorize installation of a station as soon as a request is received for temporary or emergency radiotelephone service at a fixed location. However, as soon as it is known that a station so installed is to remain at that location more than 6 months, the FCC should be notified of the permanent location by the filing of a Form 401.



Shown is the base station for the Central Virginia Telephone Company's radiotelephone system. Equipment is unique in that it operates directly into automatic exchange, eliminating need for operator to handle mobile and fixed radiotelephone calls. The covers have been removed for photo purposes from the bottom four panels which contain the termination portion of the equipment. Top panels are standard Motorola metering equipment, power supply, transmitter, receiver and blower.

TELEPHONE ODDITIES
HAVE TO HANG UP NOW ALICE-IVE GOT COMPANY
FOR MORE THAN TWO HOURS, A MAN IN LONGVIEW, TEXAS, TRIED TO REACH HIS WIFE BY TELEPHONE, FOUND THE LINE BUSY. FINALLY, FED UP, HE CALLED POLICE AND TOLD THEM: "SEND A SQUAD CAR OUT TO MY HOUSE AND TELL MY WIFE TO GET OFF THE TELEPHONE AND CALL ME"
ONCE UPON A TIME THERE WAS A MAN—
TOM HIGGINS JR. + RUTH
DETERMINED ILLINOIS BELL SYSTEM FOR SIX YEARS SOUGHT AN ANSWER TO WHY SQUIRRELS NIBBLE AT LEAD SHEATHING ON CABLES, NOW THEY BLUSHINGLY THINK THEY HAVE THE ANSWER— PREGNANT SQUIRRELS
BEFORE LEAVING FOR HER RECENT VISIT TO THE U.S. QUEEN ELIZABETH MADE A SERIES OF RECORDINGS TO BE PLAYED TO PRINCE CHARLES AND PRINCESS ANNE AT BEDTIME—THIS IDEA HELPED TO REDUCE PALACE PHONE BILLS—

REA has published a pamphlet entitled "Use of Two-Way Radio for Subscriber Service and Its Use in Construction and Maintenance of Telephone Systems" that we send to borrowers who are interested in installing a mobile radio system. Included in the pamphlet is an FCC Form 401 which has been filled out as a sample with comments on the various questions on the form. Also, REA has copies of Section 930 of the REA TE & CM entitled "Use of Point-to-Point Radio in Telephony."

Conclusions

IN CONCLUSION, we believe that through the REA contracts for the development of dial mobile radiotelephone equipment, the successful operation of the Automatic Electric and Motorola, Inc., equipment during the past few months of field testing is a major step forward in making it possible for small telephone companies to provide mobile and rural radiotelephone service to the public within the area they serve by wire lines.

We are pleased with the cooperation and interest which the Central Virginia Telephone Corp. and the North Florida Telephone Co. has shown in allowing these tests to be made on their systems. Also, we appreciate the cooperation of the FCC in granting the necessary rule waivers to permit automatic operation. The interest generated and the publicity given these installations has spurred other companies in the development and production of dial operated mobile equipment.—*George E. Dodrill.*

Manager PAUL A. FROEMMING aimed at maximum efficiency.

Billing system used by Souris River Mutual Aid Corp. permits company to handle its billing operations rapidly, easily and accurately. With modern equipment two employes easily handle complete billing routines for company that provides telephone service to 2400 subscribers in 25 towns and their surrounding areas and averages approximately 10,000 toll tickets per month.

WE MODERNIZED OUR BILLING OPERATIONS

By PAUL A. FROEMMING*

THE SMOOTH flow of work through a system with many automatic features permits us to handle our billing operations rapidly, easily and accurately. We have the exact status of every subscriber's account, and our billing controls assure us our figures are correct. Although we have 2400 subscribers and average around 10,000 toll tickets per month, all billing work is handled by two office personnel, one of whom also handles other assignments.

The Souris River Telephone Mutual Aid Corp. was founded on October 13, 1951, to provide modern telephone service to 25 towns and their surrounding areas in the Souris River Loop. This is an area of about 6400 square miles in north central North Dakota. Head offices for the company were established in Minot.

Immediate, I might even say eager, acceptance of our services launched us into a program of rapid growth and expansion. By the time we had 650 subscribers, we realized the day would come when the office staff would have to expand or work overtime, files of toll tickets would create storage problems, and we would be in such a hurry to keep up with the increasing work volume that our policy of accuracy would be jeopardized.

After considerable study, investigation and plain hard work, we developed a system that overcame our billing problems.

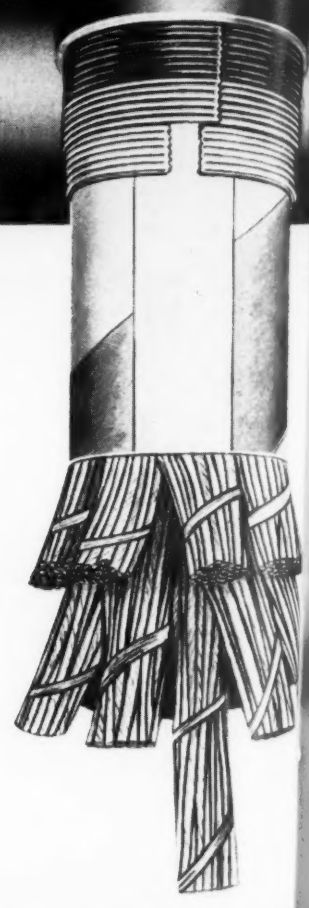
To even out the work we set up cycle billing dates, so that bills are now mailed on the 1st, 5th, 10th, 16th and 24th of each month.

We then installed the following equipment: A billing machine for writing bills, posting ledgers and producing journals; a ten-key adding machine to summarize toll tickets and establish control figures; and microfilming equipment for preparing images of toll tickets and eliminating filing and storage problems. All billing work is handled and equipment operated by Delores Thomas and Bonnie Brekke.

When a subscriber's application for service is ap-

Mr. Froemming is manager, Souris River Telephone Mutual Aid Corp., Minot, N. D.

from LEICH...



Now — Leich offers you Alpeth and Stalpeth Sheathed Cable — General Cable's two new types of sheaths. Here you have two types of telephone cable with all the protective qualities you need, without all the excessive weight.

Installation is more economical with these new developments. For example, in aerial installations, there is a reduction in messenger strand size and pole supports, or an increase in span lengths. With these lighter weight sheaths, pulling in underground systems is easier and less expensive.

Like all General Cable products, the moisture-and-corrosion resistant outside cover will guarantee you years of dependable service.

Whatever your cable needs may be, you can get the full story of Alpeth and Stalpeth sheaths from your Leich representative.

*Manufactured and sold under patent license agreement with the Western Electric Company.

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Stalpeth *

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★ **installs rapidly**
★ **superior performance**
★ **greater economy**

ALPETH

Alpeth is ideally suited for polyethylene insulated telephone cable. It consists of a combination of 2 components: a low-resistance aluminum tape shield applied longitudinally over the cable core; and an extruded, high molecular weight, moisture- and weather-resistant polyethylene jacket. Alpeth has full color coding. Available in conductor sizes, 26 AWG, 24 AWG, 22 AWG and 19 AWG in cables ranging from 6 to 404 pairs. Send your inquiries for prices and deliveries now!

STALPETH

Stalpeth offers a superior degree of protection against diffusion of moisture and is better suited for protection of paper insulated telephone cable. Stalpeth consists of 3 components: first, a corrugated aluminum shield tape is applied longitudinally over the cable core; secondly, a corrugated, coated steel tape is applied longitudinally with the overlap seam soldered; and finally, an extruded, high molecular weight, moisture- and weather-resistant polyethylene jacket is plastic cemented to the steel tape. Available in sizes 26 AWG, 24 AWG, 22 AWG, and 19 AWG in cables ranging from 16 to 2121 pairs. Send your inquiries for prices and deliveries now!

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INDEPENDENT

manufacturers of telephones, switchboards and related apparatus since 1907

DELORES THOMAS sorts toll tickets by exchange and number, the first step in the billing procedure.

Using a ten-key adding machine, MISS THOMAS summarizes toll tickets, and establishes control figures.

proved, an order is issued which describes the installation and provides information needed by the installer and for accounting and directory.

In accounting an addressograph plate and a ledger are made up for the subscriber. The ledger becomes, in effect, the subscriber's history record.

As local calls are placed, standard charges apply. For long distance calls or telegrams, the operator prepares a toll ticket describing the service.

Toll tickets are sent daily to the billing department, where Delores sorts them according to exchange and number. During the month other charges and credits are noted on tickets and are sorted by Delores.

As a billing date arrives, Delores uses her ten-key adding machine to summarize subscriber's toll tickets for the month and to enter the total charge on a toll statement which is prepared in duplicate.

Delores then summarizes other charges and credits together with the toll statements onto a "Other Charge Summary." The totals of all current month's bills are then brought forward onto a "Billing Control." These totals include tax, rental, long distance tolls, other charges, directory advertising and total current billing.

Immediately, Delores has established control figures for subsequent balancing and proving of accuracy. She then microfilms the tickets and duplicate copy of the toll statement, which will accompany the subscriber's bill.

Original toll statements are referred to Bonnie, who uses the billing machine to post a three-part bill, the subscriber's ledger and a billing journal in one operation.

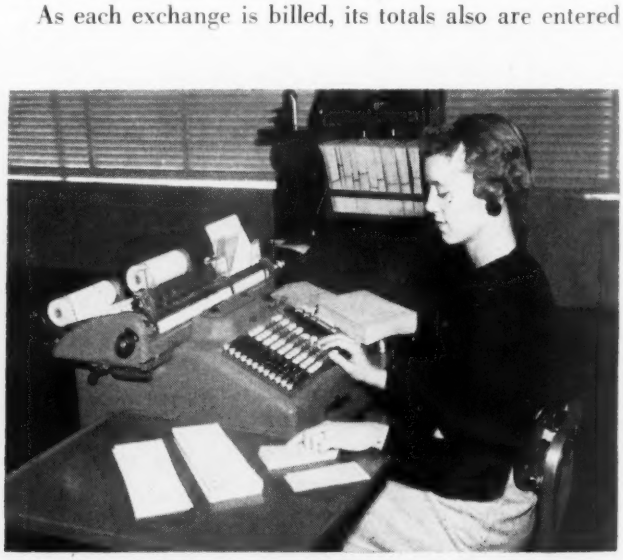
To accomplish this, she merely indexes *one time* the amounts of charges, word keys which describe each charge and any arrears or credits. The due date and bill total are furnished automatically.

During the billing work, the following totals accumulate in the machine: Rental, long distance tolls, directory advertising, other charges, arrears, credits, equity, membership, tax and total current billing.

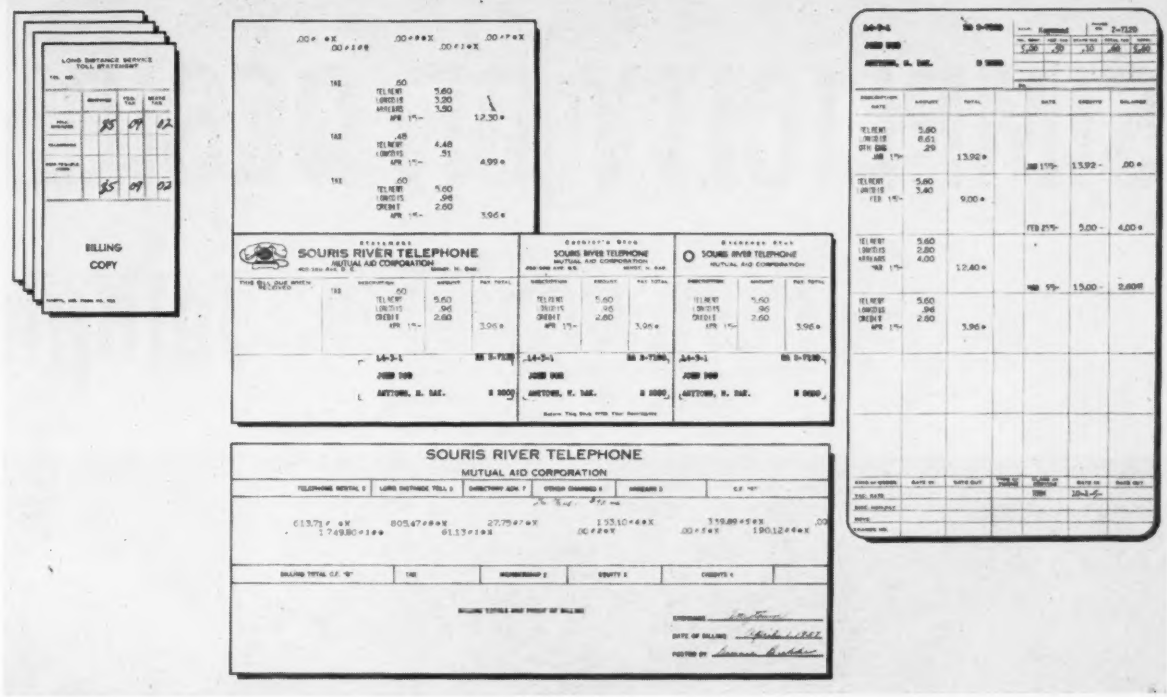
At the end of a billing run, Bonnie clears these totals from the machine, which print on a "Billing Totals and Proof Of Billing" form. The totals must, of course, agree with the control totals previously established by Delores to assure overall accuracy.

As each exchange is billed, its totals also are entered

MISS THOMAS microfilms toll tickets and statements which are sent to customer along with bill. Microfilm images serve as company's record.



BONNIE BREKKE prepares bills. Operation is so fast and automatic that Miss Brekke also uses the machine to handle material and supplies ledgers.



From toll ticket statement (top left), journal, three part bill and ledger are posted in one operation. Each charge is entered once in the Sensimatic. Note totals provided automatically on bottom form.

on a Billing Summary, so that at the end of the month we have totals for overall company billing.

The toll tickets, duplicates of toll statements and other charges or credits, tickets and the bill with the cashier's stub attached are mailed to the subscriber. The original toll statement, other charges and credits tickets and the exchange stub remain in the office.

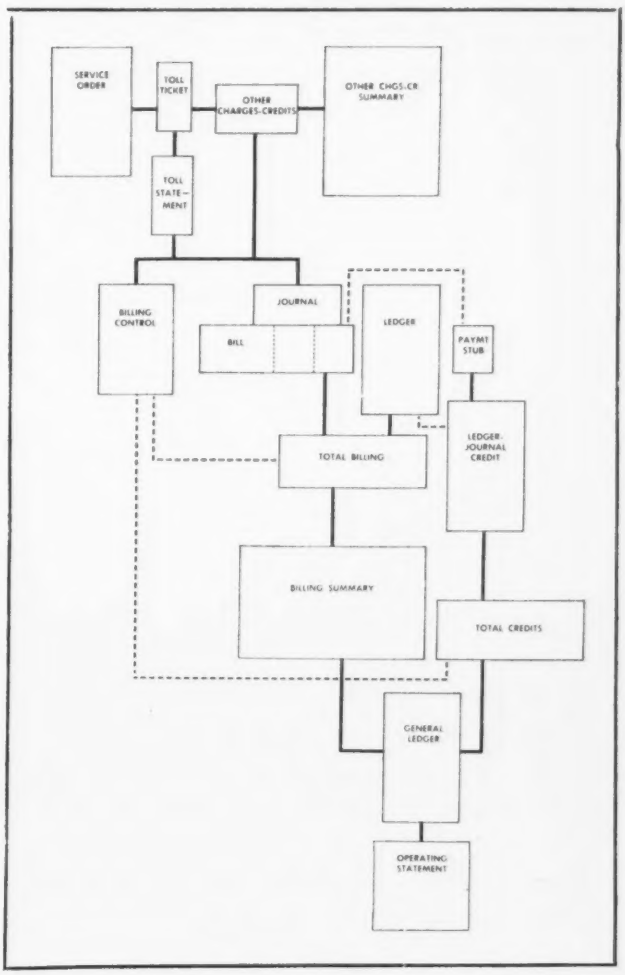
The entire procedure is very simple and smooth. Delores sorts daily, and two or sometimes three days before a billing date she begins summarizing, establishing controls and microfilming. Bonnie then writes the bills on the Sensimatic. We do not attempt to set work performance or speed records. However, the definite procedures that we have established permit Bonnie and Delores to keep billing work up to date.

Payments are received by Delores, who indicates receipt on the cashier's and exchange stubs, lists the amount in a cash receipts journal, prepares the bank deposit slip and totals the amounts received. This total is noted on the Billing Control to immediately establish a control figure.

From the exchange stubs, Bonnie then credits the subscribers' ledgers. To accomplish this she merely indexes into the billing machine the balance due by the subscriber and the amount paid. This prints the date, payment amount and new balance on the ledger and on a journal.

At the end of the credit run, the total of all payments received prints on the journal. This total must balance with the control total previously set by Delores.

Once the accuracy of billing work is proven, it is a simple matter to transfer the totals to the general ledger



From service orders to operating statements, billing work at Souris River follows a specific flow with firm controls.

SIMPLICITY OF DESIGN... a

Telephone M

Automatic Electric research and design engineers combine their talents to plan the simplest possible construction for Strowger Automatic equipment.

...another reason why ...e Men Choose Strowger!

When purchasing central office equipment, the experienced buyer looks for a product that offers *minimum maintenance.* That's why so many telephone men choose Strowger Automatic. You see, Strowger operates on a step-by-step principle and is designed with the simplest possible construction. This keeps adjustments and repairs to a minimum. The position of the switching components permits visual tracing of circuit operation. This speeds your initial training of personnel and makes trouble-shooting quick and easy.

PROVE IT FOR YOURSELF! Visit a Strowger Automatic exchange. You'll see that Strowger offers unsurpassed simplicity in design. You'll also see the craftsmanship and quality construction of this famous equipment. Then get in touch with us. We'll be glad to help you in any way possible. *Write Automatic Electric Sales Corporation, Northlake, Illinois. Or, call Fillmore 5-7111.*

AUTOMATIC ELECTRIC

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for
TIPTON
September 1957
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"YELLOW PAGES"
ITS YELLOW PAGES TELL YOU "WHERE TO BUY IT"
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BARBER-GREEN CO. has published a 16-page booklet describing the Model 784 ditcher.

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Trenchers

FOUR-PAGE bulletin from Charles Machine Works, Inc., describes new features offered on Model M "Ditch-Witch" trencher. This new trencher, introduced early in 1957, is now offered with the following features as standard equipment: 9.2 H.P. AENL Wisconsin air cooled engine; larger 6-12 drive wheels for better traction; quick adjusting clutch link to adjust for drive belt stretch to keep trencher performing at top efficiency; and two types of digging teeth — cup cutters and chisels — to provide most efficient digging under all conditions.

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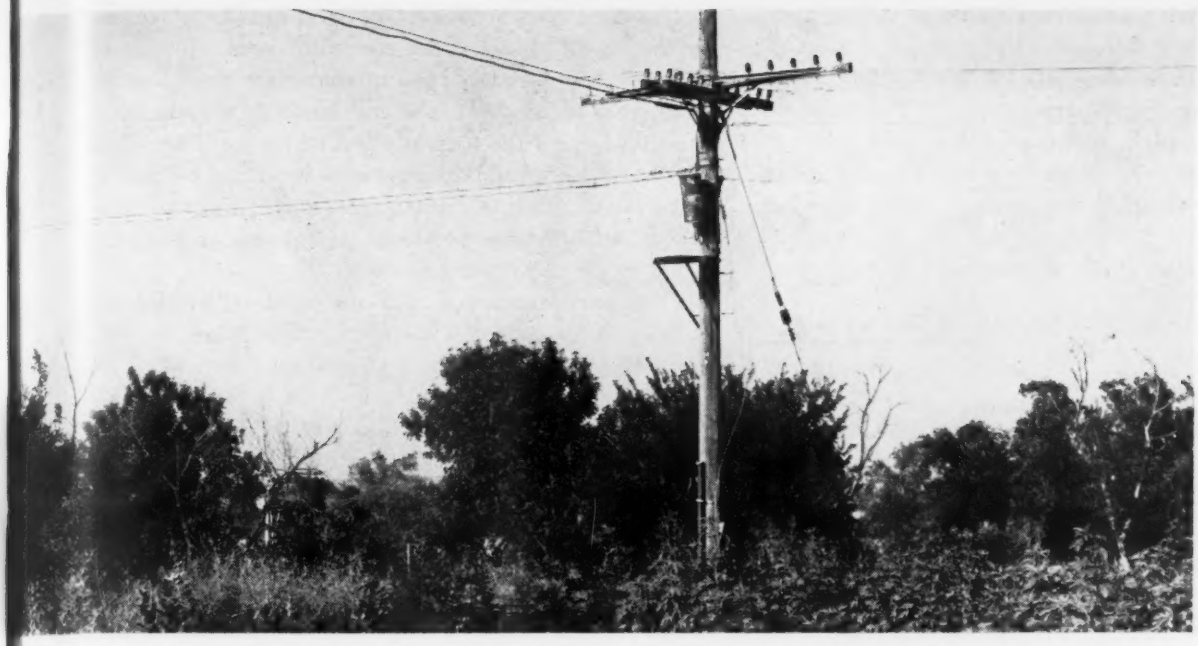

A TE&M OPERATING MANUAL

Making Open-Wire Terminations

By JOHN S. REED

At points where the open-wire lead changes its direction or terminates, a special construction of the pole fixture supporting the wires prevents twisting and distorting of the fixture.

IN AN OPEN-WIRE lead, the weight and the tension of the line wires exert a pulling force on the poles and associated fixtures, termed "wire load." This load varies with the number of wires and the tension of the wires. Storm stresses increase the wire load, sometimes to the extent of breaking the wires, poles, and fixtures.

For poles in straight sections of the lead, the pulling force in the direction of the lead (longitudinal load) on each pole is balanced by an opposite and equal force in the other direction. In this case, there remains the downward pull or vertical load which the poles support very easily since it results only in compression of the wood. However, when the line wires are carried on crossarms, this vertical load exerts a leverage on each arm proportional to the distances of the wire attachments on the arm from the crossarm brace attachments. The crossarms, nevertheless have ample strength to resist the bending force except under an ice and wind load exceeding their strengths.

It should be noted that the vertical load on the poles varies with the amount of the line grade changes. Where the lead goes up a hill, there will be an up-pull at the change in the grade, instead of a down-pull.

At points where the open wire line changes its direction or terminates, the longitudinal force becomes unbalanced. Unless compensated for, the resulting unbalanced load pulls over the end or corner pole, and distorts or damages the wire supporting fixtures. The effect of this unbalanced load is greatly increased by storm stresses and ice accumulation on the line wires.

Guying the pole at these points compensates for the unbalanced load and keeps the pole in place. However, a special construction of the pole fixtures is needed at these locations to prevent distorting or breaking of the fixtures.

At angles in crossarm leads, a double crossarm construction is employed to increase the strength of the fixture. At dead-end points where the line wires abruptly

terminate, the wire load is usually too great for even a double crossarm and, in time, the arms will bend and twist, the last effect being due to the insulator pins exerting a leverage on the arms.

Reinforcing a single crossarm with a steel brace is not wholly effective in preventing this twisting effect and the steel brace itself will gradually buckle as the arm twists. *Figure* 1 illustrates the torsion effect encountered in both types of reinforced fixture construction.

Modern measuring techniques

for accurately determining the behavior of electromagnetic waves

MICROWAVE MEASUREMENTS

By EDWARD L. GINZTON

Professor of Applied Physics and Electrical Engineering, Director of Microwave Laboratory, W. W. Hansen Laboratories of Physics, Stanford University

514 pages, 6 x 9, 375 illustrations, $12.00

After describing the generation and control of microwave signals, the book discusses the characteristics and relative merits of microwave detection and measuring devices. It then gives you a full background in measurement of impedance, including important factors which determine the accuracy of results. Techniques for measuring frequency, wavelength, resonant-cavity characteristics, and attenuation in four-terminal networks are thoroughly explained. The book treats all these topics from the practical viewpoint, and supplies mathematical justifications in convenient footnotes to assure you of a firm basis for successfully using the methods.

The author worked closely for many years with the late W. W. Hansen, considered the founder of the modern microwave field. During the last war Dr. Ginzton made major contributions to the the development of Doppler radar systems and other advances. He is the sole or joint inventor in about 50 patents on klystron tubes and circuits, radar systems, microwave-measuring devices, and other electronic developments.

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To overcome the distortion of crossarms at unbalanced load points, brackets with spool insulators (*Figure* 2) were developed to enable the line wires to terminate in line with the axis through the crossarm and thus avoid the torsion effect of the insulator pins. At first the dead-end brackets were employed on double crossarms, but this construction soon gave way to a single arm of large construction for ease of assembly on the pole and lower labor cost.

The porcelain spool insulator used with dead-end brackets is capable of withstanding 3500 pounds of concentrated beam load. The bracket itself will hold a pole of about 1500 pounds which is considered ample for most long span jobs using high strength steel line wire when the brackets are attached directly to the pole.

The standard dead-end arm has a cross section of 3″ x 5″. The strength factor of the dead-end arm is greater than that of a double standard arm (3¼″ x 4¼″) assembly. Its shorter overall length (6 feet) as compared with that of the pony arm (8½ feet) and the standard arm (10 feet) also provides greater resistance to bending.

Figure 3 illustrates the dimensions of the dead-end arm and the method of equipping the arm with dead-end brackets and spool insulators. Spacings of the dead end brackets for open wires in non-joint and joint construction are indicated in *Figure* 4.

It will be noted that the construction so far discussed makes use of dead-end arms placed to pull against the pole. This arrangement is intended to reduce the compression strain on the arm at the bolt hole because of the small bearing surface presented by the 2″ x 2″ square washer. Nevertheless, many companies are using the front mounting arrangement of dead-end arms illustrated in *Figure* 5. A large and heavy square washer (½″ x 4″ x 4″) is employed for greater bearing surface, the 2″ x 2″ square washer being retained to cover the large center hole in the big washer for the through bolt. This arrangement is claimed to be better from a

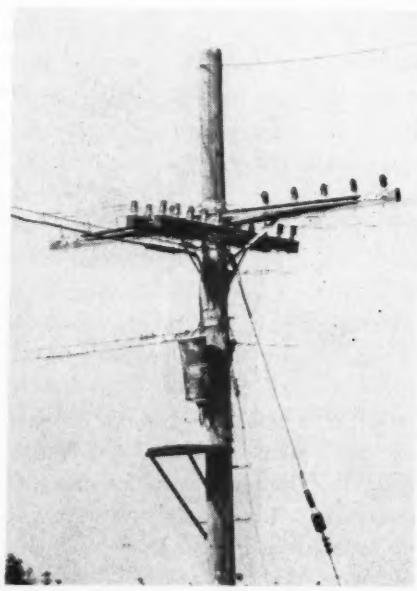

FIG. 1 (left): —Showing old type double arm and single arm with back brace, twisted and distorted by wire load.

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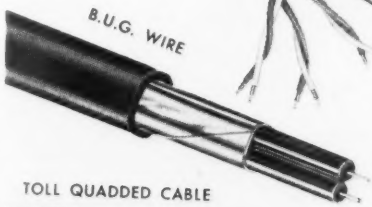

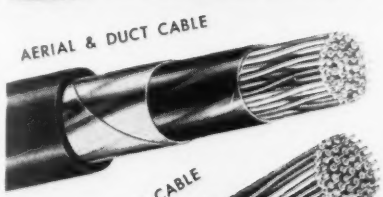

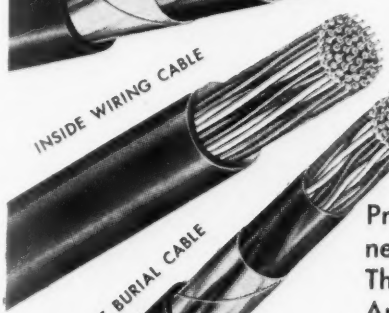

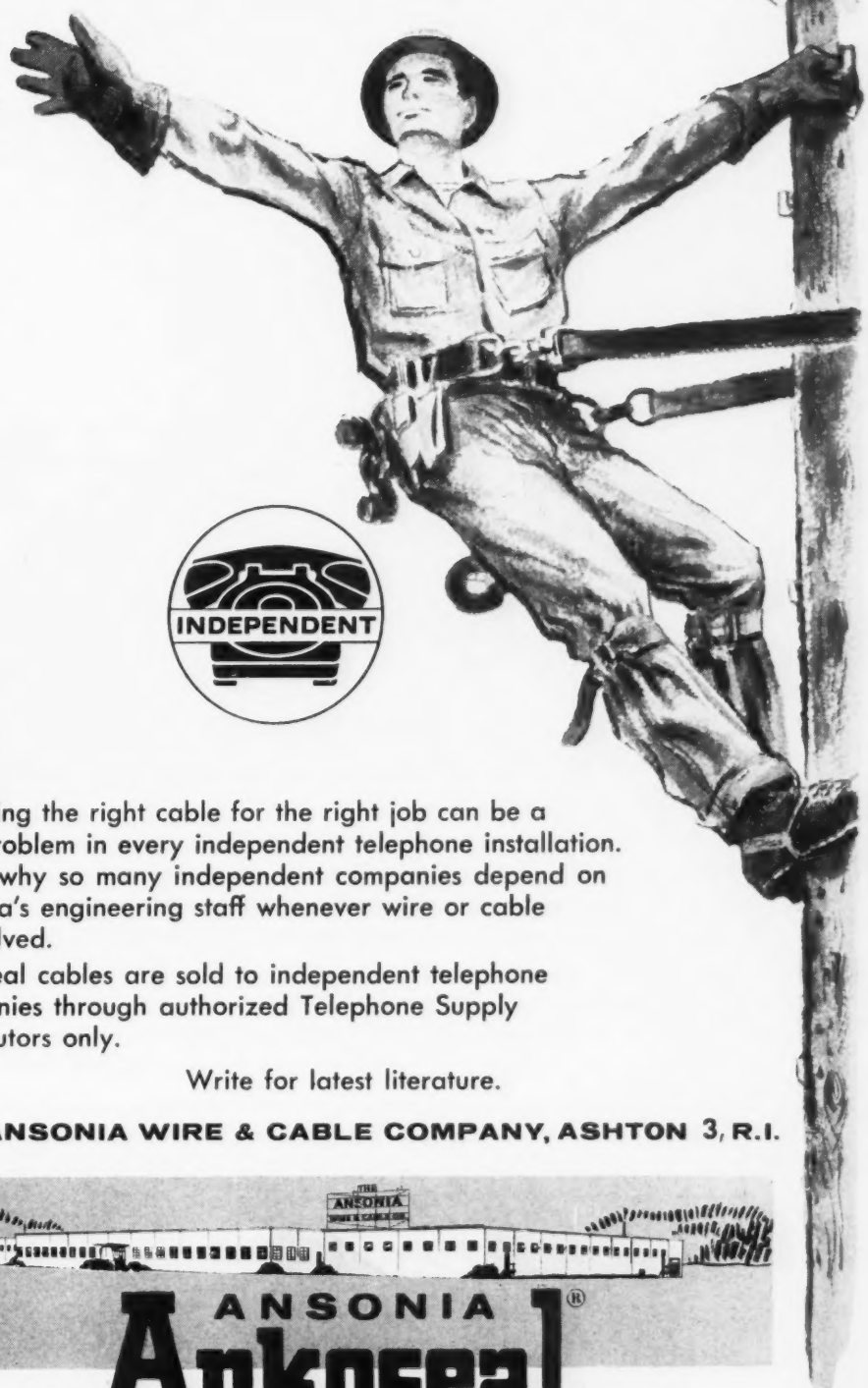

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climbing space standpoint, particularly in joint construction and at buckarm corners.

Figure 6 illustrates the use of dead-end arms in a buckarm corner construction with the arms pulling against the pole. This illustration also shows how it is possible to dead end wires from opposite directions by assembling a dead-end bracket on each end of a carriage bolt through the arm.

Dead-end arms of the cross section given in this discussion can be used without steel braces in open wire leads having spans of standard lengths. However, in long span construction with the full number of line wires on each arm and extremely long spans, it will be necessary to provide a special back truss on each dead-

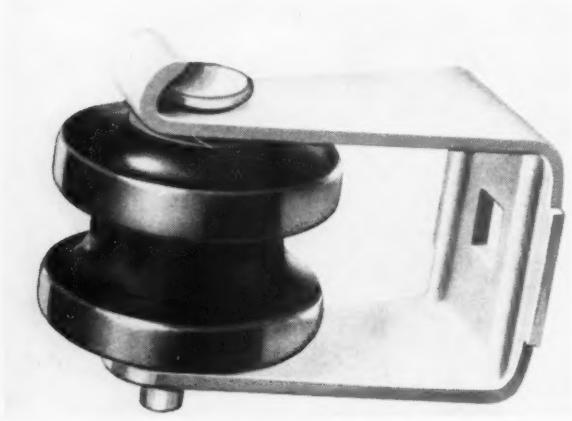


FIG. 2: — Typical dead-end bracket and spool insulator. (Courtesy of A. B. Chance Co.)

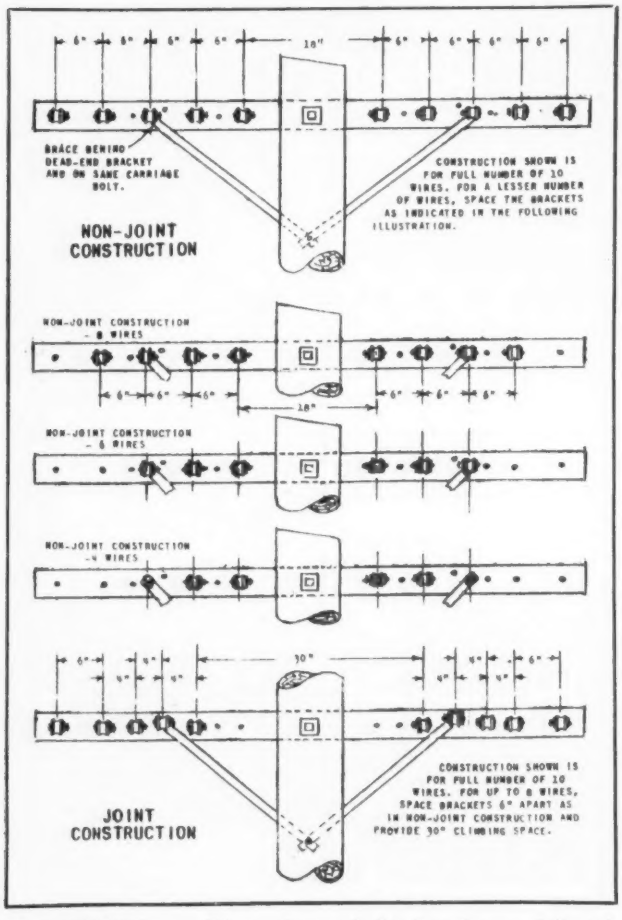

BRACE BEHIND DEAD-END BRACKET AND ON SAME CARRIAGE BOLT.
CONSTRUCTION SHOWN IS FOR FULL NUMBER OF 10 WIRES. FOR A LESSER NUMBER OF WIRES, SPACE THE BRACKETS AS INDICATED IN THE FOLLOWING ILLUSTRATION.
NON-JOINT CONSTRUCTION
NON-JOINT CONSTRUCTION - 8 WIRES
NON-JOINT CONSTRUCTION - 6 WIRES
NON-JOINT CONSTRUCTION - 4 WIRES
CONSTRUCTION SHOWN IS FOR FULL NUMBER OF 10 WIRES. FOR UP TO 8 WIRES, SPACE BRACKETS 6" APART AS IN NON-JOINT CONSTRUCTION AND PROVIDE 30" CLIMBING SPACE.
JOINT CONSTRUCTION

FIG. THREE: — Dimensions of dead-end arm (above) and equipment used on dead-end pole in crossarm lead.

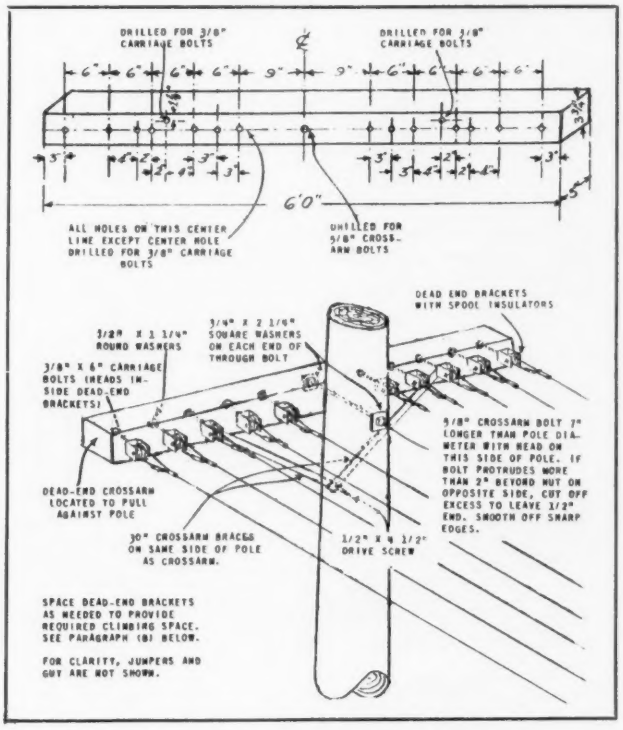

DRILLED FOR 3/8" CARRIAGE BOLTS
DRILLED FOR 3/8" CARRIAGE BOLTS
6'0"
ALL HOLES ON THIS CENTER LINE EXCEPT CENTER HOLE DRILLED FOR 3/8" CARRIAGE BOLTS
DRILLED FOR 5/8" CROSS-ARM BOLTS
DEAD END BRACKETS WITH SPOOL INSULATORS
3/4" X 2 1/4" SQUARE WASHERS ON EACH END OF THROUGH BOLT
3/8" X 6" CARRIAGE BOLTS (HEADS INSIDE DEAD-END BRACKETS)
5/8" CROSSARM BOLT 7" LONGER THAN POLE DIAMETER WITH HEAD ON THIS SIDE OF POLE. IF BOLT PROTRUDES MORE THAN 2" BEYOND NUT ON OPPOSITE SIDE, CUT OFF EXCESS TO LEAVE 1/2" END. SMOOTH OFF SHARP EDGES.
DEAD-END CROSSARM LOCATED TO PULL AGAINST POLE
30" CROSSARM BRACES ON SAME SIDE OF POLE AS CROSSARM.
1/2" X 3 1/2" DRIVE SCREW
SPACE DEAD-END BRACKETS AS NEEDED TO PROVIDE REQUIRED CLIMBING SPACE. SEE PARAGRAPH (8) BELOW.
FOR CLARITY, JUMPERS AND GUY ARE NOT SHOWN.

FIG. FOUR: — Spacings of dead-end brackets in non-joint and joint construction.

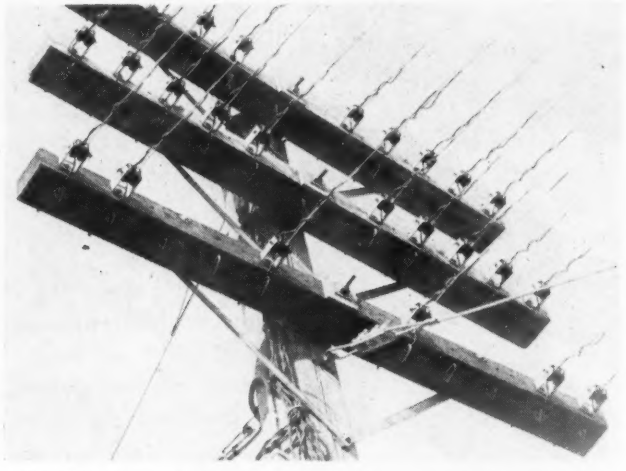


FIG. FIVE: — Dead-end arms in front mounting arrangement. Note use of 4″ x 4″ square washer with smaller square washer for increased bearing surface.

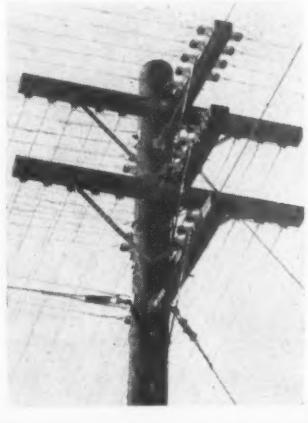
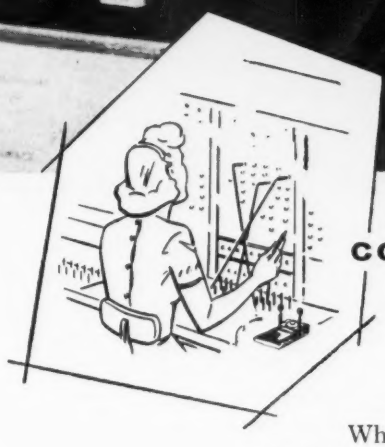


FIG. SIX: — Typical buck arm construction using dead-end arms.



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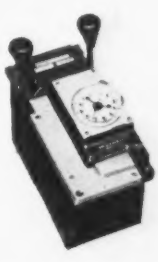

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end arm to reduce the heavy strain on the arms.

Where it is desired to employ a dead-end construction with standard 10-foot crossarms (not bored for insulator pins), a crossarm back truss is available that will properly distribute the strain. Such a device is illustrated in *Figure 7.*

For two-wire (bracket leads), the dead-end brackets are attached directly to the pole by means of extra long carriage bolts. The versatility of the dead-end brackets in various situations is illustrated in *Figure* 8.

Compression dead-end sleeves or sleeves with stainless steel bail are available for attaching the line wires to the spool insulators on dead-end brackets:—*John S. Reed, Technical Editor.*

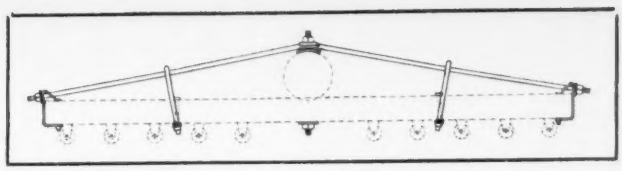
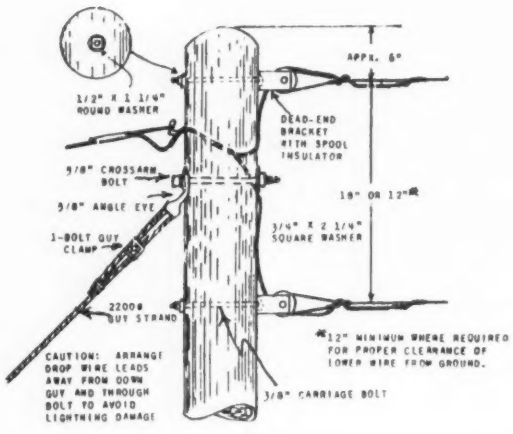
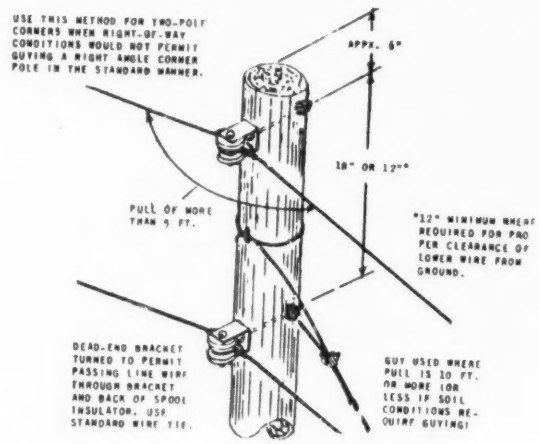


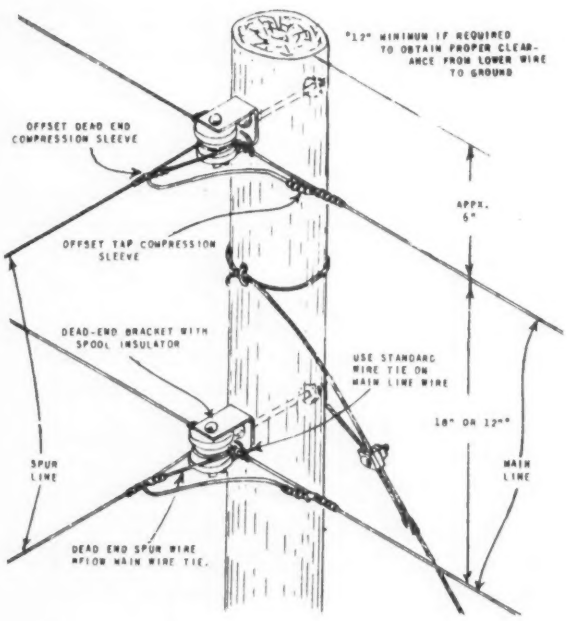
FIG. SEVEN: — Standard crossarm (not bored for insulator pins) using back truss to reinforce arm at dead-end point.


APPX. 6"
1/2" X 1 1/4" ROUND WASHER
DEAD-END BRACKET WITH SPOOL INSULATOR
5/8" CROSSARM BOLT
18" OR 12"*
5/8" ANGLE EYE
3/4" X 2 1/4" SQUARE WASHER
1-BOLT GUY CLAMP
2200# GUY STRAND
*12" MINIMUM WHERE REQUIRED FOR PROPER CLEARANCE OF LOWER WIRE FROM GROUND.
CAUTION: ARRANGE DROP WIRE LEADS AWAY FROM DOWN GUY AND THROUGH BOLT TO AVOID LIGHTNING DAMAGE
3/8" CARRIAGE BOLT

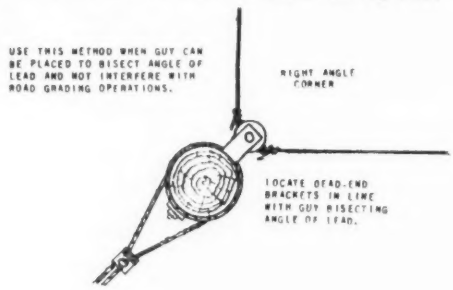
Dead End Construction in 2-Wire Bracket Lead


USE THIS METHOD FOR TWO-POLE CORNERS WHEN RIGHT-OF-WAY CONDITIONS WOULD NOT PERMIT GUYING A RIGHT ANGLE CORNER POLE IN THE STANDARD MANNER.
APPX. 6"
18" OR 12"*
PULL OF MORE THAN 5 FT.
*12" MINIMUM WHERE REQUIRED FOR PROPER CLEARANCE OF LOWER WIRE FROM GROUND.
DEAD-END BRACKET TURNED TO PERMIT PASSING LINE WIRE THROUGH BRACKET AND BACK OF SPOOL INSULATOR. USE STANDARD WIRE TIE.
GUY USED WHERE PULL IS 10 FT. OR MORE (OR LESS IF SOIL CONDITIONS REQUIRE GUYING)

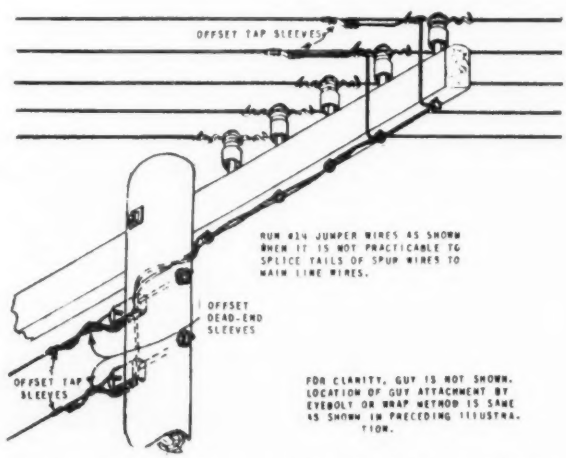
Use of Dead End Brackets at Corners in 2-Wire Bracket Leads Where Pull is More Than 5 Feet


*12" MINIMUM IF REQUIRED TO OBTAIN PROPER CLEARANCE FROM LOWER WIRE TO GROUND
OFFSET DEAD END COMPRESSION SLEEVE
APPX. 6"
OFFSET TAP COMPRESSION SLEEVE
DEAD-END BRACKET WITH SPOOL INSULATOR
USE STANDARD WIRE TIE ON MAIN LINE WIRE
18" OR 12"*
SPUR LINE
MAIN LINE
DEAD END SPUR WIRE AFTER MAIN WIRE TIE.

Method of Connecting Spur Wires to Main Line Wires in 2-Wire Bracket Leads

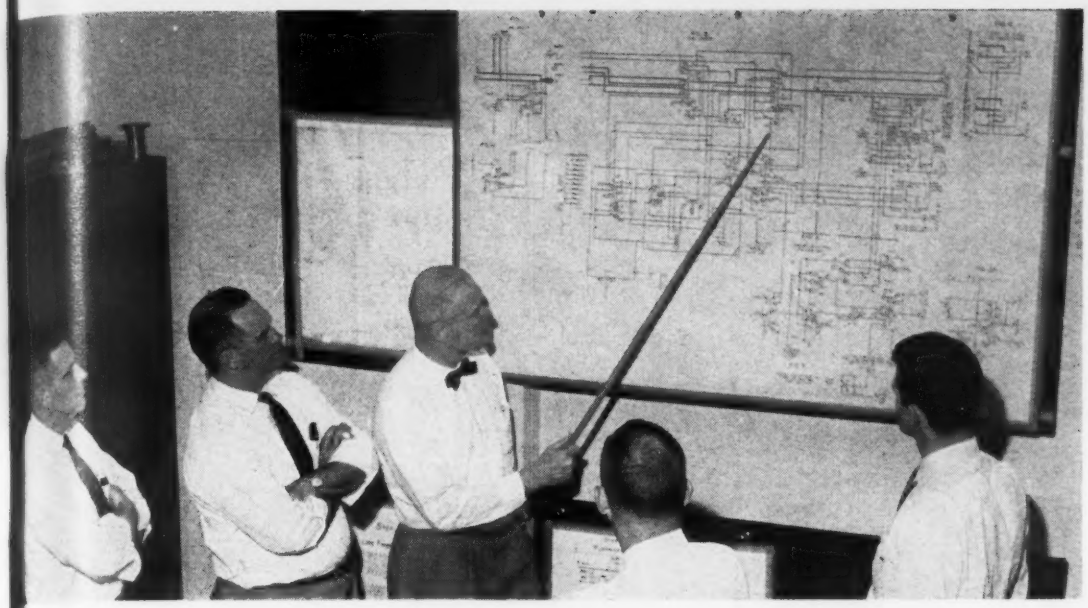

USE THIS METHOD WHEN GUY CAN BE PLACED TO BISECT ANGLE OF LEAD AND NOT INTERFERE WITH ROAD GRADING OPERATIONS.
RIGHT ANGLE CORNER
LOCATE DEAD-END BRACKETS IN LINE WITH GUY BISECTING ANGLE OF LEAD.

Use of Dead End Brackets at Right Angle Corners in 2-Wire Bracket Leads


OFFSET TAP SLEEVES*
RUN #14 JUMPER WIRES AS SHOWN WHEN IT IS NOT PRACTICABLE TO SPLICE TAILS OF SPUR WIRES TO MAIN LINE WIRES.
OFFSET DEAD-END SLEEVES
OFFSET TAP SLEEVES
FOR CLARITY, GUY IS NOT SHOWN. LOCATION OF GUY ATTACHMENT BY EYEBOLT OR WRAP METHOD IS SAME AS SHOWN IN PRECEDING ILLUSTRATION.

Dead Ending Spur Wires on Main Line Pole in Crossarm Leads

FIG EIGHT: — Typical uses of dead-end brackets and spool insulators in two-wire (bracket) leads.



"HAND IN HAND"—ABILITY and KNOWLEDGE

By T. DeWITT TALMAGE*

Manufacturer's instruction literature can also serve as the basis of many kinds of telephone company training programs.

Manufacturers Can Help

HOWEVER, no matter how extensive a library may be, it will probably contain more of the field's most helpful literature. By this is meant, the literature issued by the communication equipment manufacturers and suppliers — catalogs, instruction manuals, trade literature, application data, etc. Because of this, many telephone organizations keep their own file of such essential reference material.

If such a file is not complete, is not up to date, is not conveniently accessible when needed, or if the information is needed in larger quantities for training purposes, a wide range of literature can be secured by requesting it in writing from the manufacturers and suppliers.

In the event that the material is not stocked and must be reproduced on individual order, there may be a nominal charge involved. It is preferable to transmit such requests on your company's letterhead. However, a legibly written or printed request on a standard two-cent government postal card will receive attention just as promptly.

The manufacturers and suppliers are just as interested as you are in seeing that their communication products are wisely applied; rightly installed; correctly tested out and placed in service; intelligently operated, i.e., not overloaded or abused; and properly and economically maintained. Therefore, the engineering application manuals, the installation instructions, the operating and maintenance pamphlets, and the training manuals are all carefully prepared with one prime purpose in mind: to assist the users to get their money's worth out of the products.

Of course, such official manuals are of assistance only when studied and the instructions actually carried out. Profitable operation demands the continual use of authorized practices and procedures.

These instruction manuals, by their very nature, can also serve as the basis of many kinds of telephone plant training programs for craftsmen, technicians, engineers, and other personnel.

In the final analysis, an instruction manual becomes a valuable tool only when it is clearly understood by the man who must use it on the job. The companies issue such manuals to answer the many time-consuming questions which would otherwise arise. It's good business to get the answers to questions in advance of their actual need. *Continued on page 64*

**Educational Manager, Kellogg Switchboard and Supply Company, Chicago 38, Illinois.* *Part One of this article appeared in the January 1 issue of TE&M; Part II in the February 1 issue.*

TELEPHONE TEAMWORK. At Western Electric's Indianapolis Works, these girls handle the final assembly of telephone sets. A 2½-m long conveyor system links the various manufacturing steps, bringing components and sub-assemblies from every corner of the pl

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Capital city of Hoosier-land—and home of the "500-mile" auto race — this market town and industrial center has been the telephone "Capital" of the U.S. for ten years. Here Western Electric makes telephone sets for the Bell System—and produces a host of home-grown community benefits in the process.

Indianapolis is a small town grown big. Yet much of the small town lives on — in the spirit of the friendly people who have sparked its progress from the start.

These are the people who have sparked *our* progress at Western Electric since we came to town in 1948. Last year our big plant on Shadeland Avenue turned out 6½ million Bell telephone sets—thanks to the more than 6,000 Indianapolis people who are helping with our job as the manufacturing and supply unit of the Bell System.

As important as the telephones we make are the benefits our work helps provide. Besides jobs for our own employees, our purchases from 716 local suppliers help to extend these benefits to thousands of other men and women in the Indianapolis area. (These local companies, incidentally, are part of our statewide supplier team of 2350 firms.)

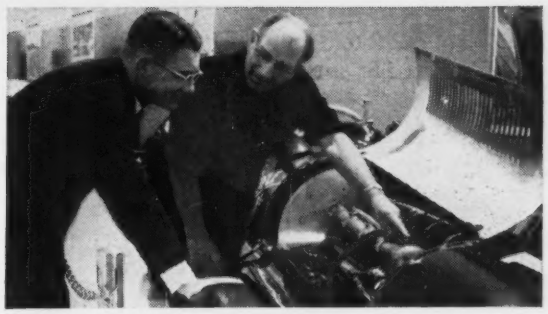
Actually, our activities affect nearly everybody in town. Local merchants, through our payrolls. City government, from the taxes we pay. Civic and social life, through the participation of our employees.

In Indianapolis, these economic and social contributions are an important part of our job.

Besides Indianapolis, Western Electric has factories in 25 other cities where we also make telephone equipment for the Bell System. Last year we purchased 1¼ billion dollars worth of raw materials, products and services from our nearly 33,000 suppliers located in every state. Of these, 90% are "small businesses." The things we make and buy are distributed to the Bell telephone companies through Western Electric distribution centers in 32 different cities.

Western Electric

MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM



SPEEDWAY MUSEUM at the Indianapolis "500" track houses famous racing cars, mementoes of past Memorial Day events. Jack Pursel (left) of Western Electric, a native Hoosier, talks with the museum's manager.

TELEPHONE BOXES by the millions are made for W.E. by Inland Container Corp., one of many local W.E. suppliers. Here, Inland sales manager, E. M. Huxford (right) talks with Western Electric's Ken Martin.

ON STAGE at the Indianapolis Civic Theater, Western Electric employee John Benedix (foreground) and wife huddle with the director. John is typical of the many W.E. employees who are active in the city's cultural life.

JUNIOR ACHIEVEMENT company sponsored by W.E. makes and sells telephone table lamps. W.E.'s Art Rehn (center), one of the company's advisors, is typical of our workers who support valuable youth projects.

(Continued from page 61)

Hand in hand with the pressing requirement to master today's demanding job duties, is the increasingly important problem of becoming acquainted with the fundamentals of the work that is just around the corner. Because few companies are standing still, this is a constantly-present consideration for telephone company officials, supervisors, and individual employes alike.

Very few people enjoy the consequences of getting caught in the trap of being labeled a "has been." Even the Greeks had a word of warning about such deplorable situations. Freely translated it amounted to: "Many people hurry to catch up. Few to get ahead."

The tempo at which events are moving, the technological changes and the new developments being encountered on all sides sometimes gives the impression that the objectives or goal posts are constantly being moved.

A well-known telephone company's newspaper advertisement recently included a vivid illustration of a working man and a ladder. The ad touched upon this matter of everyone being so busy these days and read in part as follows: "I'd just got up on the ladder when the phone rang. Next time you call, hang on a little longer before hanging up."

A man who read this ad was reminded of the following story about the consequences of moving a ladder:

An inmate of an asylum approached a painter hard at work painting the ceiling at the institution. "Hey, mister, have you got a good hold on that brush?"

"I think so — why?"

"Well, hold on tight — I'm going to move this ladder."

Doubtless there are a number of telephone workers who feel as though someone "moved the ladder" from under them during past year. Not just once, but several times.

Changes In Technology

YET THERE are many hardy individuals who, encountering major changes in technology in their job, rolled with the punch and are still in there pitching. They are those enterprising men who survived the change-over from magneto to common-battery telephone systems. They are those energetic, career-minded employes who were interested and versatile enough to convert their skills and knowledge at the same time their company converted its service from the manual to the dial switching system.

Today, still others are engaged in mastering the essential theory and operating characteristics of the basic types of vacuum tubes because of the introduction of electronic equipment into the telephone plant. Now, in turn, the vacuum tube is being superceded in many applications by the transistor.[2]

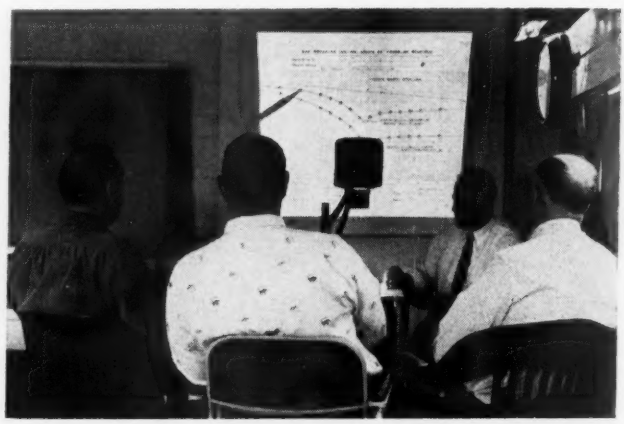
Dr. Donald Gimpel, of Panellit, Inc., Skokie, Illinois, recently told the Instrument Society of America that "by 1960 transistors will equal vacuum tubes in production and usage."

A Stanford Research Institute resume, Dr. Gimpel observed, predicts that by 1958 there will be 50 million transistors in use, and by 1959, the total will expand to 125 million. In other words, "the transistor is here to stay, their applications are ever widening, while vacuum tubes are in a static condition."

How To Study New Things

THUS IT IS apparent in many situations that a man's value to his company resolves itself into a case of: "It isn't so much what you have done or are doing that counts as it is how quick you can learn new things to do that's important."

That is the reason why the selected reference lists appended to several of the writer's previous articles, as well as this one, start out by recommending a good set



What you have done does not count so much as how quick you can learn new things to do.

of brief, direct suggestions to help improve one's study methods. If your study habits are rusty from disuse and you don't own a copy of Dr. "Art" Kornhauser's forty-five-cent booklet on "How To Study," then there's no time like the present to get one. A word of advice to those who come to this booklet for help. The advice is: *Use the suggestions.*

Summary

CERTAINLY, under conditions as described herein, one cannot keep his place if he resists progress. Moreover, as telephone service is made still more attractive and useful, the plant facilities will change accordingly in the years to come. Consequently, the working conditions to be faced will require skilled workmen with minds just as alert and just as inquiring as in any other technical field of endeavor.

Failure to "dig in" and unwillingness to tackle difficult or unpleasant assignments are sometimes common reasons for an established, technically competent em-

Please turn to page 66

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[2]*"The First Five Years of the Transistor," by Mervin J. Kelley, president, Bell Telephone Laboratories.* 14 *illus., Bell Telephone Magazine, Vol. XXXIII, pp.* 73-86, *incl., Summer issue,* 1953.

you can relax because Preformed dead-ends never will

Preformed Dead-Ends and Guy-Grip dead-ends hold full rated strength of strand

These dead-ends won't relax their tight grip. Once on, the only way to remove Preformed dead-ends or Guy-Grip dead-ends is to do so intentionally. Because of the non-slip grip and because there are no concentrated stresses and no fatigue points, your guy and messenger strands are 100 per cent safe.

Some other advantages are apparent, too. For instance, you will notice that, with Preformed, you dead-end the B-rural messenger without cutting it. Other dead-ends require cutting and some require tools for application. Also, Preformed makes it possible to go around corners without splicing.

If your dead-ending doesn't look as neat as this, if it doesn't go on as easily and assure safety, or if you have to keep checking to make sure it's holding, write PREFORMED LINE PRODUCTS COMPANY, 5349 St. Clair Ave., Cleveland 3, Ohio. Cable Address: Preformed-Cleveland . . . in 10 years the leading manufacturer of armor rods, dead-ends, Guy-Grip dead-ends and other line accessories.

PLP

You can look up to Preformed

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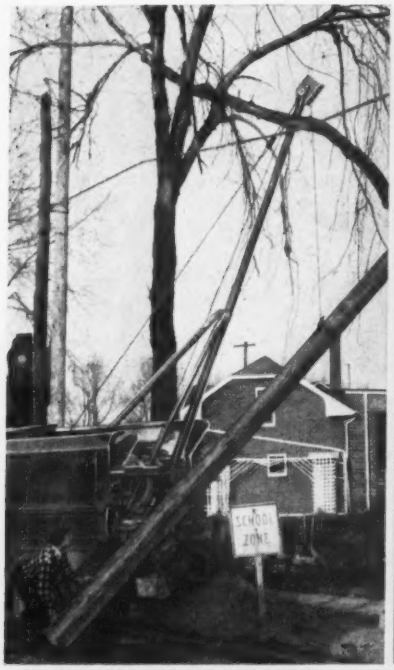
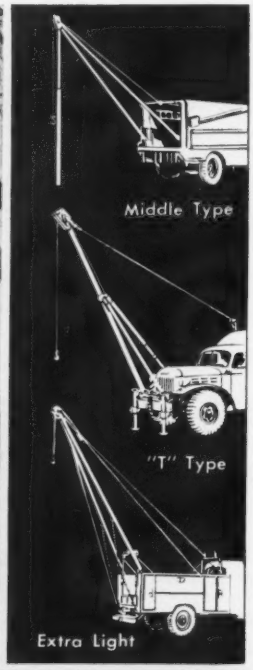
built to make the tough jobs easier





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17 models for hoisting loads up to 18,000 lbs.

EASY TO SET UP and adjust on the spot, Batavia Pole Derricks will do your jobs faster, easier and safer. Extremely versatile, they're ideally suited for setting or pulling line poles and meeting other utility maintenance requirements.

YOU NAME IT! There's a Batavia Pole Derrick that's right for you! Seventeen Extra Light, Middle and T-Type Models are available for hoisting poles up to 75' in length and work loads up to 18,000 lbs.

RUGGEDLY BUILT, all models are assembled from top-quality, cold-drawn seamless tubing of high carbon steel with a minimum tensile strength of 100,000 psi and a minimum yield of 90,000 psi. To face outdoor exposure, each derrick is primed with a rust-preventative coat and finished in red enamel.

A FULL LINE OF ACCESSORIES TOO! Truck support jacks, quick hooks, connecting pins, mounting brackets and sheave blocks are available to increase the adaptability and usefulness of Batavia hoisting equipment.

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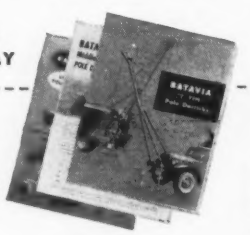

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Send detailed literature on the full line of Batavia Pole Derricks and accessories.

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ployе, who has the inside track, to be side-tracked in favor of an outsider who is willing to take risks.

No matter how proficient a worker may be there eventually comes a time, just as it does in baseball, when it is found that you can't steal second with your foot on first. Progress can and often does involve risks.

Your telephone trade journal's staff working hand in hand with all operating, manufacturing, and regulatory organizations keeps you regularly advised regarding the latest trends, developments, and sources of information. But from that point on, *you* must furnish the indispensable initiative, drive, and follow-through required to capitalize on the situation.

Selected References

(See the first installment of this article for references [1] and [2]). (*Jan.* 1, 1958 *issue of Telephone Engineer & Management.*)

[3] "How To Study — Suggestions for High-School and College Students," by Arthur W. Kornhauser, 2nd rev. ed. (original ed. 1924) 20th printing 1957. 55 pp., pocket-size booklet 4½ in. by 6¾ in. Printed by the University of Chicago Press, 5750 Ellis Avenue, Chicago 37, Illinois. Price 45 cents.

[4] "Basic Electrical Principles," (book) 2nd ed. by Maurice Grayle Suffern, 454 pp., 275 illus., 5 appendixes, and list of visual learning aids. This book is now being used in telephone plant training programs to prepare apprentices for further training of a practical nature in the specific operations and techniques required by his job duties. Price $4.00. Order from Educational Div., TE&M, 7720 N. Sheridan Rd., Chicago 26, Ill.

[5] "7 Sources of Assistance for the Small (Telephone) Companies," by L. N. Martin, Telephony, Vol. 144, No. 17, dated April 25, 1953, pp. 40, 42, 74, and 75.

[6] "Basic Vacuum Tubes and Their Uses," (book) by John F. Rider and Henry Jacobowitz. 204 pp. Published in 1955. Order from Educational Div., TE&M. 7720 N. Sheridan Rd., Chicago 26, Ill.

[7] "Fundamentals of Transistors," (book) by Leonard Krugman. 140 pp. 1954. Publisher same as [6] above. Price $2.70.

[8] "Principles of Electricity Applied to Telephone and Telegraph Work," 354 pp. January 1953. A training course text prepared for employes of the Long Lines Department of the American Telephone & Telegraph Company. This standard text should be owned and used by every telephone plant employe. May be secured from Graybar Electric Company. Price $4.80.

[9] "Mathematics for Electricians and Radiomen," (book) by Nelson M. Cooke, 604 pp. 1942. Publisher same as [4] above. Any student who can perform arithmetical computations rapidly and accurately is capable of mastering the principles laid down in this text, if he applies himself properly. Price $5.50.

[10] "How To Teach A Trade," (book) by R. W. Selridge. 111 pp. 1923. Published by Chas. A. Bennett Co., Inc., 237 No. Monroe St., Peoria, Ill. Price $2.50.

Asleep for 25 years

By John Voss

Have you ever wondered what it would be like to fall asleep for 25 years or so — and then see what's happened to the world during that time?

Lots of people — scientists, economists, engineers, writers and others — are making predictions all the time. And the majority of them seem to think it will be a pretty wonderful world. My personal feeling is that most of the predictions are on the conservative side. The way this country of ours is going, in 25 years we'll have things around us which nobody's even dreamed of.

But, you know, in a way progress is funny. A new product is put on the market . . . a scientific discovery is made . . . new manufacturing processes are developed — all in different places at different times. And while you're living with this progress, it's hard to see the forest for the trees. You don't get the whole picture until you can look back over a period of time — and then the *total amount* of change is just overwhelming.

But even though you can't see the *whole* picture of progress while it's happening, you owe it to yourself to keep your eyes and ears open all the time for *specific* developments that will help your business.

Suppose that 25 years ago you decided to standardize on a certain type of equipment. You found it was doing an adequate job — and still is — so you've been sticking with it.

Suddenly you realize, one day, that lots of wonderful things have simply passed you by — almost as if you'd been asleep for 25 years!

Now I'm not saying that standardization is necessarily wrong. It's wrong only when you let it stand in the way of keeping up with best developments in Telecommunications.

For example, there's a great deal going on here at Stromberg-Carlson — especially since we opened the new additions to our Telecommunication Plant. Now we have 800,000 square feet of floor space to work with — all devoted to research, design and manufacture of telecommunication equipment. You'll notice I said *research* first. There's a good reason for that.

At Stromberg-Carlson we're constantly looking for new and better ideas, products, ways of doing things. A great deal of time, talent and money are going into this kind of work because we're dedicated to keep and expand our position of leadership in the telephone industry.

That adds up to progress — *constant* progress. So when you buy equipment by Stromberg-Carlson, today or tomorrow, you know you're getting the latest and best in the industry. You can entrust *your* tomorrow to today's leader.

How long has it been since you've taken a real good look at the things that have been happening in telephony in the past few years? Perhaps you have questions that we can answer for you. Just drop me a line.

And remember — Stromberg-Carlson isn't going to fall asleep — not even for 25 *seconds!*

John H Voss

Vice President and General Manager
Telecommunication Division
STROMBERG-CARLSON, A Division of General Dynamics Corp., Rochester 3, N. Y.

Advertisement

PLANT NOTES ON NEW DEVELOPMENTS

By JOHN S. REED

Testing Procedure Detects Bad Grounds: Lessens Chances For Equipment Failures

PROGRAM of checking central office and outside plant grounds on an annual basis is important to detect open or high resistance grounds which might cause failure of telephone protective equipment in these locations with resulting damage to plant apparatus, cable, and central office equipment.

This protective equipment operates when a power wire comes in contact with a telephone line or a lightning stroke induces a high voltage charge in the line. A good low-resistance ground will effectively disperse the lightning discharge or cause rapid operation of the power system overload protection, thus promptly removing the dangerous power voltage from the telephone lines involved.

Grounds at the following locations should be regularly tested:

(1) Central office ground bus.

(2) Line protectors or protected terminals at junctions of open wire and cable when it is company practice to place a buried ground at these points.

(3) Buffer protection points.

(4) High voltage type protectors in open-wire joint construction.

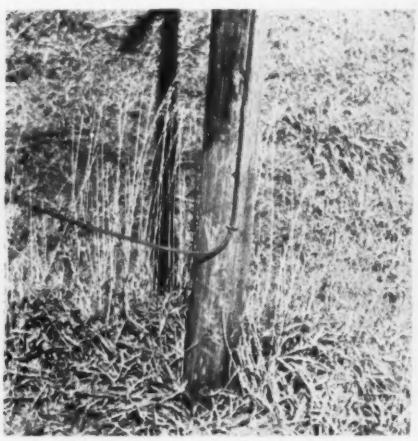
(5) Underground railroad crossings of telephone circuits.

(6) Repeating and drainage coils.

(7) Line filters (at junction points).

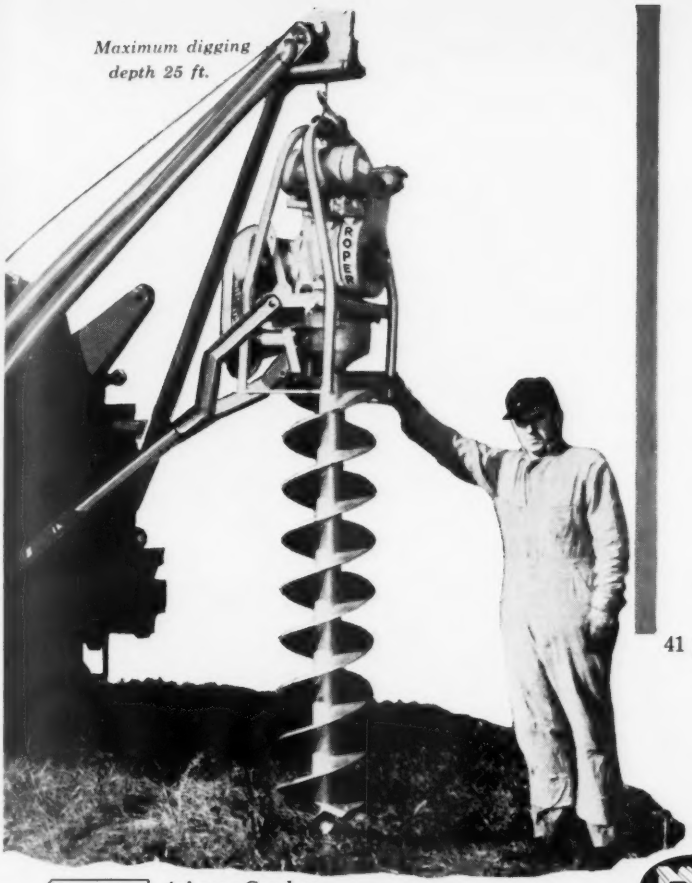
(8) Office grounds of connecting companies with carrier facilities owned by telephone company.

The apparatus used for detecting bad grounds is an instrument that measures the resistance of the ground at the point where the central office or pole protector ground is installed. Since the telephone cable sheath is grounded at the central office, the ground connection is temporarily removed from the cable messenger at open wire and cable junctions to obtain the true ground resistance at these points. Resistance readings over 5 ohms at central offices and 25 ohms



This open ground lead on the buffer protection pole was originally in its normal vertical position and would never have been detected even on close inspection. It was neatly severed at the ground line, evidently by a mowing machine that had approached too close to the pole.

Ground testing instrument (Vibroground) in use. Inspector is holding down button which sets device in operation. Two of the leads shown connect to auxiliary ground rods pushed into the earth about 20 feet away from the ground under test. The third lead goes to the ground wire at its connection in the protector mounting on the pole. The pointer knob in the center of the instrument panel is turned until the meter above it registers zero and the reading is then taken from the knob position on the dial.



Maximum digging depth 25 ft.

DIGS AND SETS 41 POLES IN 9 HOURS

with a Roper automatic hole digger

Listen to what Fred F. Cannon, a Midwest contractor of telephone pole lines has to say: "I have dug and set 41 poles in a 9-hour day with 2 men on the truck and 3 men following and setting poles. I feel I cannot buy a better digger, better suited for heavy construction work than the Roper particularly *since a Roper digger saves me the cost of expensive power take-off equipment.*"

The Roper digger needs no PTO. It digs a straight or angle hole from any truck, jeep or tractor equipped with front or rear boom and winch. Write for prices and specifications today!

Distributed by GraybaR

Ask your Graybar representative about the Roper automatic hole digger!

ROPER **Roper Manufacturing Company** 248 Elm Street
ZANESVILLE, OHIO

Now you can *buzz through* wet cable sections and not have to test from field and office ends.

MURPHY BUZZER RELAY SET (BR-1)

To increase the usefulness of the famous Murphy Cable Tester, the new Buzzer Relay Set gives you a dependable, economical way of "buzzing thru" wet cable sections over a greater resistance without having to add too many batteries.

The BR-1 will buzz thru a loop resistance of 0 to 1000 ohms. Only one 4½ volt battery is used in the set and it is enclosed in a cabinet with a special "balanced armature" relay. Dimensions of the Murphy Buzzer Relay Set are 3½ x 6 x 3 inches. It is shipped complete with a pair of water proof cords for connecting to the Murphy Cable Tester, and a heavy duty 4½ volt battery.

Write for prices and additional information.

Order your new Model VC Test Cords for use with Murphy Cable Tester. Made of high quality, extremely flexible, test wire, they're insulation tested at 20,000 volts . . . assure no "leakage" readings.

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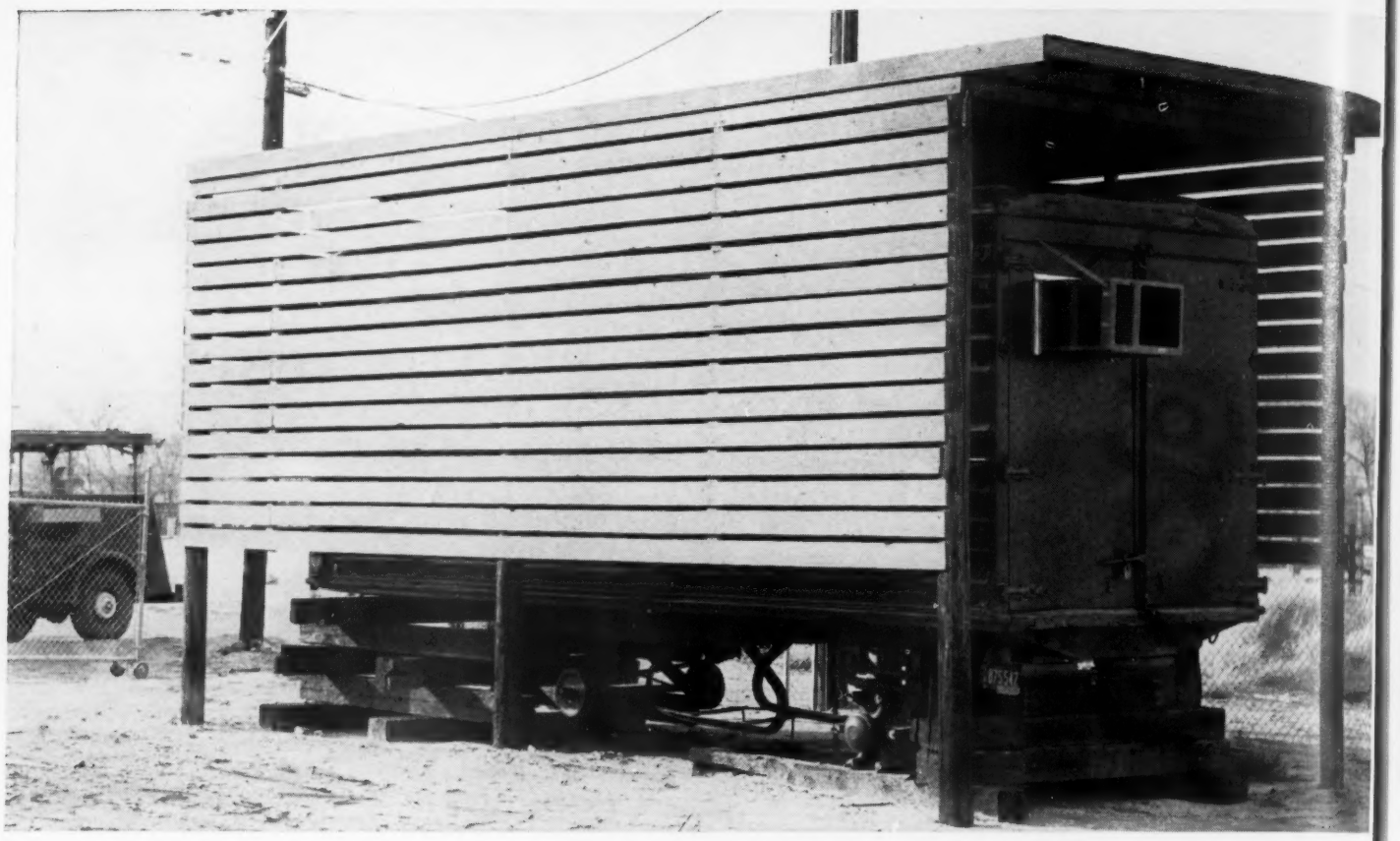

Lucerne Valley trailer in which 5 complete channels of Lynch B-120 subscriber line carrier equipment were installed.

First subscriber carrier installed in a trailer

helps meet 90-day cut-in deadline with 5 new circuits for California Interstate Telephone Company

When the Kaiser Permanente Cement Company planned their new $15,000,000 plant at Lucerne Valley, California, they asked Interstate for 5 circuits—*within 90 days.*

Since the nearest existing plant was twelve miles from the site, the situation called for some original thinking. Willard Wade, California Interstate's president, found a newspaper ad listing used trailers for sale. Immediately R. F. Nale, purchasing agent and J. F. Wegforth, central office engineer for Interstate, checked the trailers. They found one suitable to house subscriber carrier equipment, and Wally Kenney, Graybar Telephone Specialist, was called in.

W. C. Robinson (left), district plant superintendent, J. F. Wegforth (center), central office engineer, and Wally Kenney (right), inspect rural carrier equipment installed in the trailer.

In a matter of days, Graybar delivered 5 complete channels of Lynch B-120 subscriber line carrier equipment. This was installed and the trailer was hauled to its present location, Lucerne Valley. With the teamwork of everyone at Interstate, from the president down, plus fast staff work by Graybar, the unit was cut into service —on time.

Speaking of Graybar, Mr. Wade says: "The trailer-housed subscriber carrier is one of several 'firsts' established by the California Interstate Telephone Company. These would not be possible, however, without the excellent cooperation we have received from our suppliers, such as Graybar.

"We have enjoyed our relationship with Graybar for years. We have found that whether our problems are normal, routine ones, or completely unpredictable emergencies, Graybar people will always cooperate with us to the utmost."

Graybar is proud of its service to Interstate and other independent telephone companies in every State in the Union. For decades, we have supplied equipment to meet the specialized needs of independent telephone companies. Today, there are more than 130 Graybar offices and warehouses. In addition to pole line supplies, central office equipment, linemen's tools and safety equipment, more than 100,000 items of "everything electrical" help to make Graybar the working stockroom for many fast growing independent telephone companies.

Graybar Telephone Specialists and personnel are eager to work with you. Graybar, too, is an independent company, solely owned by its operating and retired personnel. You get *personal* service from people who have a *personal* interest in giving you the assistance you need.

Willard Wade has been president of California Interstate Telephone Company for the past three years. Prior to that he was general manager. Mr. Wade has been in the utility business since he graduated from the University of Colorado in 1930. He is past president of the California Independent Telephone Association, has served as Mayor of the Town of Bishop.

Bob Nale (left), purchasing agent for California Interstate Telephone Company, listens to a suggestion made by Wally Kenney, Graybar Telephone Specialist, on an equipment purchase order.

Call Graybar first for...

Graybar QUALITY *Everything Electrical*

INDEPENDENT

GRAYBAR ELECTRIC COMPANY, INC.
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IN OVER 130 PRINCIPAL CITIES

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TEST EQUIPMENT

Locates Trouble FAST

MODEL A
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Exploring Coil Amplifier
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Chicago 10, Illinois

Contemporary style has been achieved in Trend without sacrifice of comfort. Thickly padded with foam rubber...fiber glass bases on the swivel chairs.

trend

two new executive swivel chairs and an executive guest chair

by Sturgis

The Sturgis Posture Chair Company, Sturgis, Michigan. Address inquiries to the company's General Sales Offices, 154 East Erie St., Chicago 11, Ill.

(Continued from page 68)

at pole protector locations calls for an investigation to determine the cause of the high reading, and corrective measures are then taken to reduce the resistance to a value below the maximum permitted.

This program has already proved its worth in revealing a surprising number of open or high resistance grounds, which might never have otherwise been detected. These defects are corrected when found, thus assuring maximum protection for the telephone circuits and central office equipment.

"Make-It-Yourself" Drainage Unit Will Reduce Voltages to Safe Value

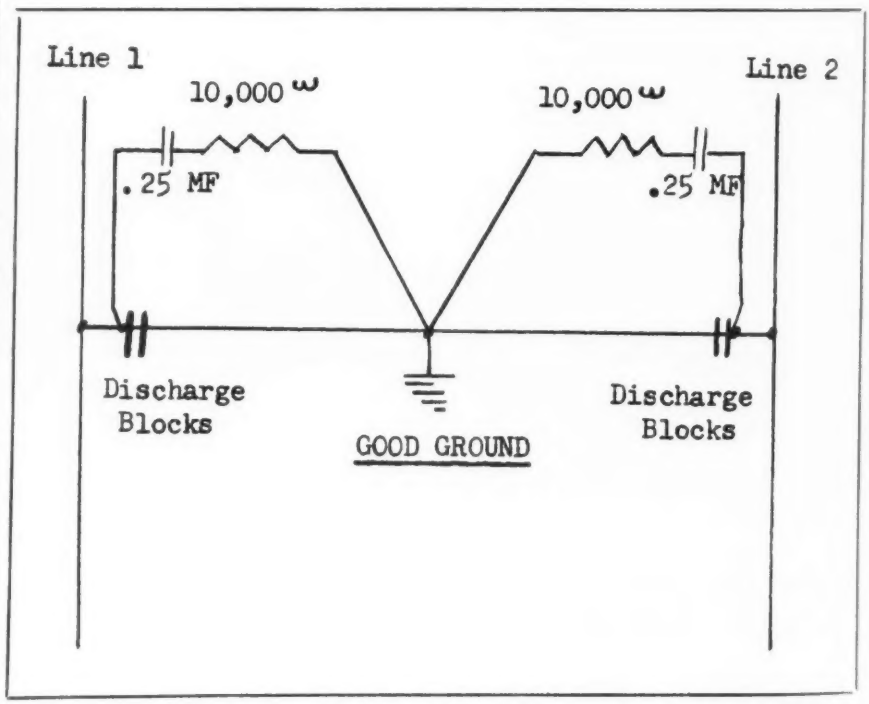
WE ARE indebted to *Hugh Straughn*, secretary of the Oklahoma Telephone Association, for the following idea on a simple drainage unit which is economical and easy to make.

The accompanying illustration shows the diagram of connections for the drainage unit which consists of 2 oil-fired 25-MF capacitors rated at 1000 volts DC, 2 resistors of 10,000 ohms each, rated at 40 watts mounted in an outside type station protector and wired as indicated in the diagram. The fuses are eliminated in the protector leaving the resulting space for mounting the capacitors and resistors.

This drainage unit will reduce to a safe, 60 cycle induced voltage on open wire metallic telephone circuits that closely parallel power distribution systems and will hold the induced voltage to less than 50 volts for exposures up to 10 miles of parallel.

A good ground is essential for successful operation of this drainage unit. Three driven grounds spaced three feet apart in line with the pole lines are recommended. No. 6 insulated copper wire should be used for the ground lead and for interconnecting the driven rods.

This or any other type of drainage unit should not be used on circuits that employ 60 cycle ringing current to ground since this unit is designed to drain 60 cycle AC to ground. *Got a helpful idea? Send it in.*



Circuit connections for "Make-It-Yourself" drainage unit to reduce induced voltages on open wire lines to a safe value.

How far are you from a telephone...right now?

If your telephone rang *now*, could you reach it conveniently? Thoughtfully placed phones throughout your home—in workshop, bedroom, kitchen—can save hundreds of steps each day! Additional phones *in color* are part of the bright new convenience of service by America's 4,400 Independent telephone companies ...providing *two-thirds of the nation* with the very best in local and long distance communications.

INDEPENDENT TELEPHONE COMPANIES

helping you reach all America

U.S. Independent Telephone Association
Pennsylvania Building, Washington, D.C.

TELEPHONE ASSOCIATION ACTIVITIES

New Rural Telephone Association Meets: Represents REA Telephone Borrowers

By HERMAN R. MC DONALD
President, Halls Telephone Co., Inc., Fountain City, Tenn.

ON DECEMBER 5, 1957, the first meeting of the Rural Telephone Association (RTA), a newly-formed association for telephone companies financed by the Rural Electrification Administration, was held at the Penn Hotel, Monroe, La. The intent is to make this a national organization and from the interest and enthusiasm shown by the telephone people representing nine states, the new association stands every chance of becoming successful on a national level.

The meeting was called to order by Al M. Cobb, RTA secretary and president-manager of the LaSalle Telephone Co., Inc., Jena, La. Clark M. Williams, chairman of the program committee and president of United Telephone Co. of Louisiana, Marion, La., made his report on the preparations and the program for the meeting.

Wm. L. Henning, president, Cameron Telephone Co., Sulphur, La., made an inspiring and enthusiastic address on "*What R.E.A. Means to the Independent Telephone Industry.*" He outlined the progress of Independent telephony from the early days through the recent celebration of the industry's 60th anniversary.

Henning pointed out — "The telephone industry does not have to hold its head in shame when it comes to the word 'progress'. In this age of rockets and guided missles, the telephone manufacturers, from their reservoir of experience and research have contributed heavily to the numerous marvels of modern science."

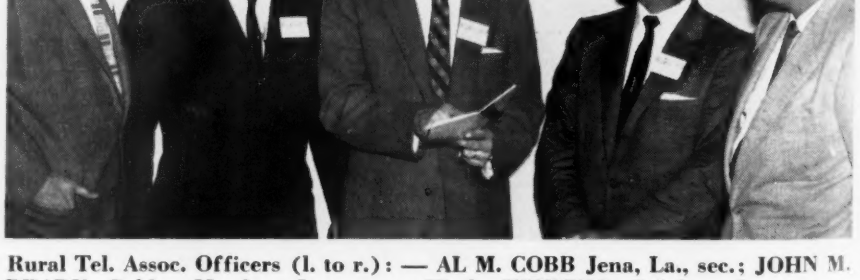
Reminding the group that "the first 50 years were the hardest," Henning said, "Most of you have been participants in the great advancement within the last decade, others of you built through sweat, tears and sometimes through poverty, the foundations upon which the industry launched its rocket . . . . The last 10 years, to the operator who had such experiences have been the climaxing years for him; the years during which he became an operator of a real telephone system. These 10 years bring us to the subject of my talk, 'What the R.E.A. Means to the Small Independent Telephone Company'."

Describing his earlier experiences and opinions of R.E.A., Henning said, "I am firmly convinced that R.E.A. has made the last 10 years the difference between the first 50 for the small Independent telephone companies and I believe that I can tell you what the R.E.A. means to these companies with all sincerity and humility."

Henning explained he became acquainted with the telephone section of R.E.A. at its inception and was in the program before the R.E.A. could become fully organized.

"Frankly," he said, "in those early stages I often wondered if we would ever get the first R.E.A. financed pole in the ground, and as late as 1953 I was leveling a great deal of criticism on the R.E.A., its policies or rather its lack of policies and manner of progress.

"In 1955, two years later, at an R.E.A. meeting in New Orleans, our system was completed and we had started on an expansion program. I then and there made a public acknowledgement that many of us would not be in the telephone business today were it not for the R.E.A. I further said that the R.E.A. rejuvenated the telephone industry as a whole, not only by its loaning of funds, but by its stimulus in causing others to make financing available to other Independent telephone com-



Rural Tel. Assoc. Officers (l. to r.): — AL M. COBB Jena, La., sec.; JOHN M. BRADY, Golden Meadow, La., pres.; W. L. HENNING, Sulphur, La., v. p.; H. C. WOMACK, Chatham, La., treas.; MIKE BANKER, Gonzales, La., director.

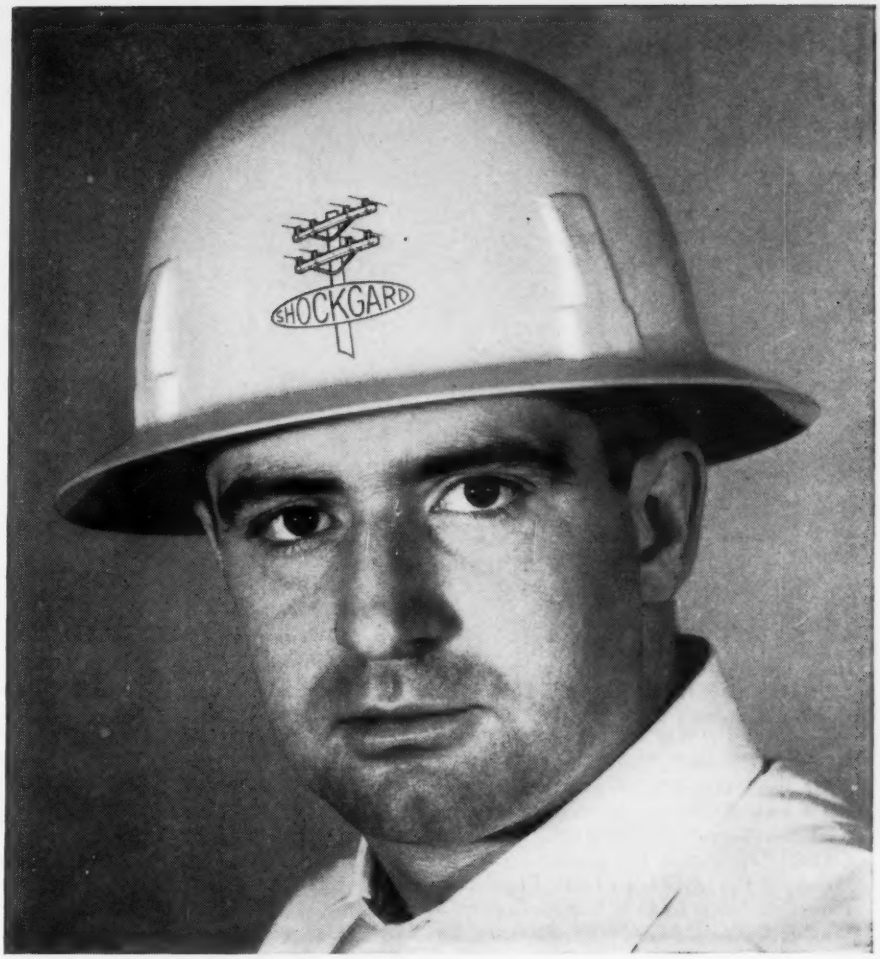
panies, including some of the larger ones, and to focus national attention on the telephone industry, which consequently, facilitated selling of bonds and stocks by the larger Independent companies to a previously unknown market.

"I concluded this talk with reference to R.E.A. by saying, 'R.E.A. can learn from us and we can learn from R.E.A.' A great deal has been accomplished, but the job is not over, much remains to be done. But by working hand in hand with the R.E.A. through the years, the small companies will have a program they will be proud of. I think here in the State of Louisiana we can say, that through the years we have worked with the R.E.A. and even though it was very difficult and trying at times we are now proud of that relationship."

Referring to "Hurricane Audrey" which brought death, destruction, and desolation to the Cameron Telephone Co. area, Henning reported the hurricane crashed inland into Cameron with "water higher than our telephone poles and winds so terrific that wind gauges broke from the force."

"The storm continued all that day until late evening," he said. "I personally was 50 miles inland and sat through the storm in comparative safety. Often during the height of this storm I would look out of my window as the wind would bend the trees to the ground and run a quick estimate in my head of the possible damage to our telephone plant. Frankly, my highest figure was not over $40,000.00. Little did I realize at that very moment, men, women, and children were losing their lives, houses were being torn asunder and floating away.

"On a helicopter trip the following morning, made to determine what extent we were damaged, it was difficult to even think of telephones. Bodies were all around . . . . Dead cattle by the thousands floated in the marshes . . . . Boats were commonplace in the highway, in the yard, and in the center of town. A drilling barge tender, had been thrown out of the river into the highway. It had smashed five automobiles as though



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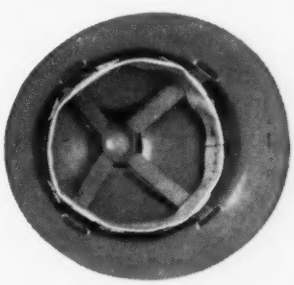

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Industry members attending recent RTA convention included — BOTTOM ROW (l. to r.) H. C. WOMACK, Chatham, La.; JOE CHERAMINE, and LIONEL J. LEGARDE, La Rose, La.; AL M. COBB, Jena, La.; CHARLES B. HARVERY, Golden Meadow; BEN W. HOPGOOD, Collinston, La.; EARL CONRAD, Breaux Bridge, La.; JOHN BRADY, Golden Meadow, La.; WM. L. HENNING, Sulphur, La. SECOND ROW (l. to r.): — D. A. STEPHENSON Woodlawn, Ill.; RUSS STEWART, Motorola, Chicago, Ill.; D. L. FAIL, Bay Springs, Miss.; WEBB D. SHIVERS, Florence, Miss.; HOWARD RASMUSSEN, South Sioux City, Neb.; JOHN A. MYERS, Glenmora, La.; LLOYD TEEKELL, Glenmora, La.; EDWARD CONRAD, Breaux Bridge, La. THIRD ROW, (l. to r.): — HERMAN R. McDONALD, Tenn.; L. J. DENNEY, Amherst Va.; C. C. TOMME, Ringgold, La.; MIKE BANKER, Gonzales, La.; HOLEMS GARISON, Jena, La.; HOWARD CARROLL, Baton Rouge, La.; LOUIS WILSON, Athens, La.; FOURTH ROW (l. to r.): — FRED STRAHAN, Golden Meadow, La.; GEO. L. LEE, Plain Dealing, La.; H. H. SCHULZE, Russelville, Ark.; MARVIN L. GUNTER, Motorola, Houston, Texas; JACK EGLE, Golden Meadow, La.; J. T. HENNING, Cameron, La.; GLENN J. STOVER, Mount Vernon, Wash.; BOB ELLINGTON, Monroe, La. TOP ROW (l. to r.): — GLYN P. WHITTEN, Shreveport, La.; BOB WALTERS, Shreveport, La.; JIM HARVEY, Baton Rouge, La.; CLARK WILLIAMS, Marion, La.

they were tin cans . . . . Buildings, timbers, roofs, tin, tanks, iron and steel, concrete, personal belongings and often bodies were all mangled and twisted together in an unimaginable conglomeration . . . ."

Describing the telephone plant, Henning said "the cables and poles were not even in the vicinity of where they should be."

"In some instances," he said, "they had been washed a mile or two back into the marshes. Two exchanges were flooded with salt water. The Cameron exchange (a 12-inch, double concrete block wall) was nothing but debris. The complex exchange equipment, carrier and microwave, was nothing but junk mixed in with the concrete blocks and the salt water. Damage to the area totaled in the millions; to us the actual damage was nearly a half million dollars. . . ."

Giving a complete report on the methods used to restore telephone service at Cameron, Henning referred to the work performed by Earl Patterson, REA Field Representative, Walter Rich, REA Washington's office; Jerry Denton, REA section engineer; Hiram Sprout, REA field engineer; and Tom O'Reilly of REA.

"These men," Henning said, "worked day and night going in and out of the disaster area. They were in the area before the authorities could start cleaning it up. They stumbled and stalked their way through the filth, dirt and debris, trying to determine and appraise exactly what the situation was.

"Mr. Patterson interviewed anyone that would talk with him, trying to determine if anyone planned to return to the area. Mr. Denton and Mr. Sprout dealt with facts and figures, estimates and plans. After much work upon the part of these men, they came up with and recommended a new loan for the rehabilitation of our system. One week later the loan was approved; within three weeks the Public Service Commission, cooperating to the fullest extent, passed its approval of the loan; and within approximately four weeks from the date of the arrival of the REA officials, the complete loan documents were signed, and the funds were made available . . . .

"R.E.A. approved the purchase of the emergency switchboard that was ordered and placed in service. It approved the purchase of the emergency dial-to-dial mobile radio. It approved the new building and central office equipment plans and specifications and has worked with the greatest of speed on every item submitted . . . .

Henning stated that REA estimates and forecasts, with reference to the rehabilitation of the telephone market, "are proving out because the demand for service is now existing in the area."

"At the rate we are going," he said, "barring any unforeseen catastrophe, we will be back in operation, building and equipment and outside plant, all within less than 10 months after the storm, to the same extent and even larger than we were previous to the storm.

"Now of course, there are others

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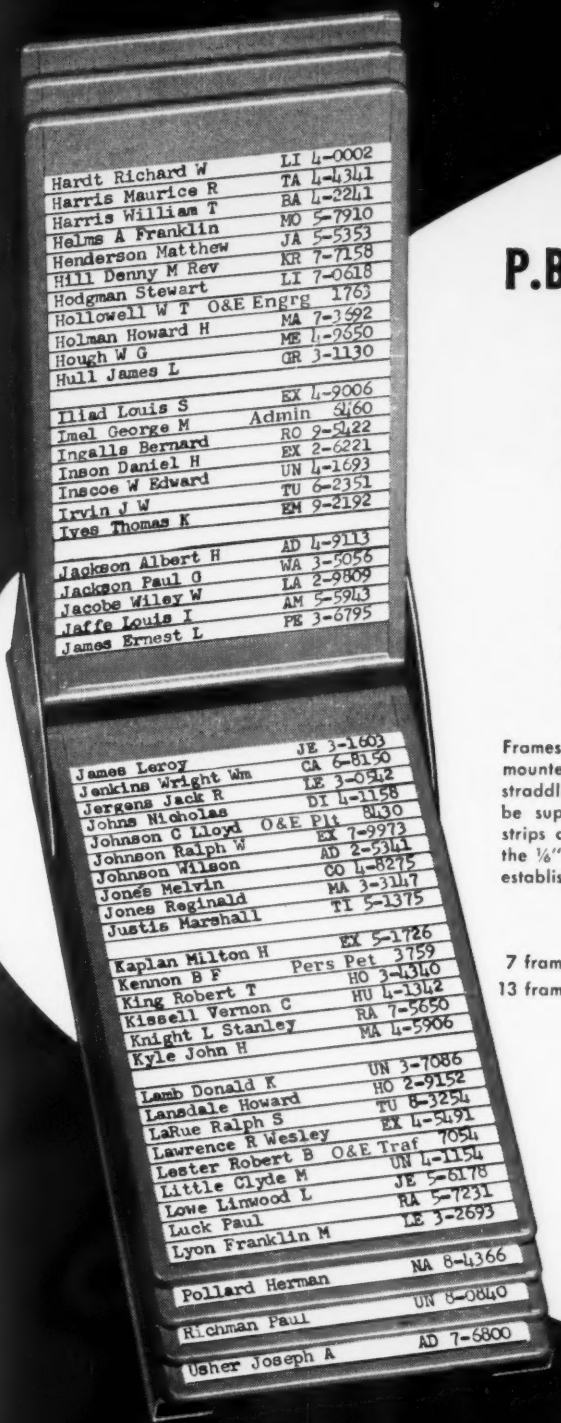
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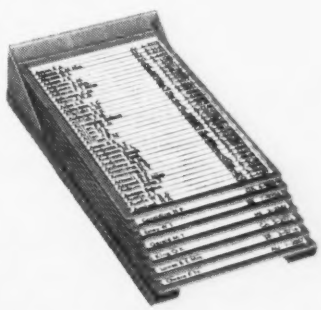

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AL M. COBB, secretary, Rural Tel. Assoc. addresses the recent convention.

that assisted in this project, many others, and I wish time would permit me to identify who they are, the suppliers, our friends here in the telephone business, the Bell System and many others. Perhaps on another day I will be given the opportunity to acknowledge all of these, but today I am trying to stress the position R.E.A. takes in such a situation to my knowledge.

"Soon after the storm, and I recall this very vividly, I was driving through the area where there was nothing; not one house, not a foundation where a community previously stood. I thought, would anyone ever finance us and assist our company in getting back in business. I truthfully believe had anyone else been our mortgagee right after that storm we would have been sold for a percentage on the dollar. The mortgagee would have taken its loss and been glad to receive whatever percentage it could out of it, because you would have been surprised at the number of people, people in responsible positions, that asked me, 'Are you going back in business down there?'

"It is a tribute to R.E.A. to have the calibre and type of men who visited me and whose judgment and foresight, particularly under the most trying and difficult circumstances, is now proving to be correct. But at the time R.E.A. went out on a limb, way out on a limb . . . . R.E.A. was interested in our telephone company and it was interested in the re-establishment of service . . . This is the human side of R.E.A. This is its personality; we may be a number to it

CLARK WILLIAMS, Marion, La., chairman RTA Convention Program Committee.

for the file, but I never will believe that is all we are any more. Whenever a crisis may arise, I think R.E.A. will be there to evaluate and see if it can possibly assist, that is, as long as it may be in existence."

Discussing the REA interest rate, Henning said, "Now I am not a socialist. I believe in free enterprise. I do not believe in government control and I am not in favor or do I advocate that the taxpayers of this country subsidize our telephone company or any other telephone company, I believe that we should pay our way. If two percent money is actually costing the taxpayers, then I say raise the interest rate. I do not want to be a part of a pressure group or try and squeeze from our congressmen any and all benefits and privileges regardless of the justice or injustice or merit of our cause. But I do say this, and it is absolutely necessary that we, as a group, with a common cause, make certain that all the facts of the R.E.A. program, its policies and procedures are made *known* and that we make certain that we have representation to answer in defense of ambiguity and misleading information that may be leveled at this program . . . ."

Referring to the two percent money, Henning said, "I do not have the facts, on a national average, but speaking from our own company I can say that as a result of this two percent money, the government has received in excise tax alone, many fold of what it received before we modernized our system. Our income tax previous to the storm was over

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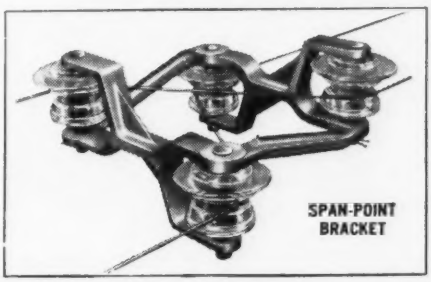

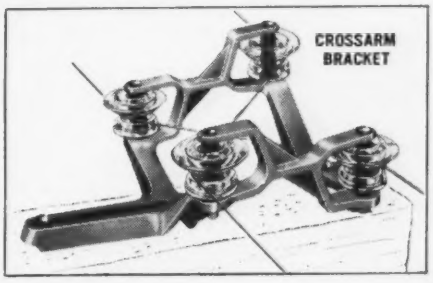

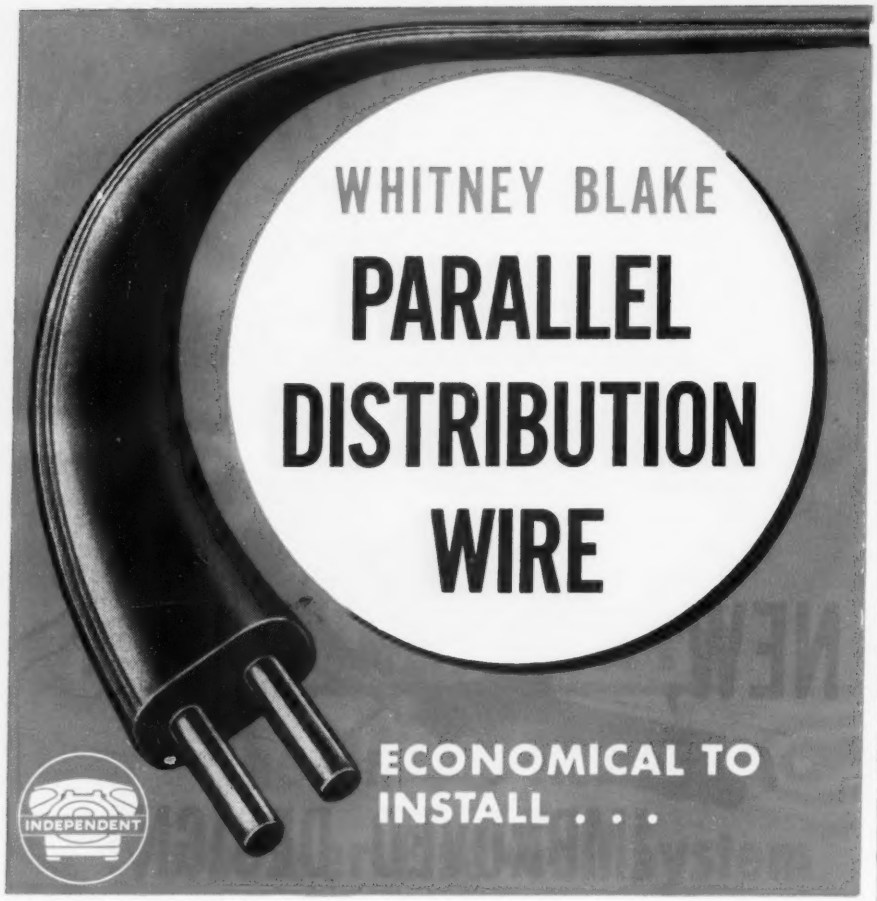

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two thousand times greater than before the two percent money was available. The extra employment of personnel has increased the personal income tax. This whole program has created a new era of activity and each phase of the activity has produced extra income for the government . . . ."

Referring to other government programs, Henning pointed to the V.A., F.H.A., and the farm program and stated, "It seems like I am not the only one being subsidized, and while we are talking about it, what about other industries and their fast tax write offs in the past? It is a different story now, when we level the subsidized guns at others."

In concluding his talk, Henning described the purpose of the Rural Telephone Association.

"We, who are participants in this program, who know the program, who know the end results of the service that the R.E.A. program will bring to the people of this country should make certain that the public knows the facts," he said. "And to assist in that, among many other things, which shall be explained later on, this organization, the Rural Telephone Association was conceived and organized. This association is not a hatchet-waving organization. It is in no way in conflict with any state or national Independent telephone association or any other telephone association. In fact, one of its purposes will be to encourage more active participation with the United States Independent Telephone Association and state groups."

Henning pointed out that every member of the Louisiana group who belongs to the Rural Telephone Association is also a member of the Louisiana Telephone Association.

"From talking to everyone of these gentlemen," he said, "I know they intend to stay very active in those two organizations. This organization is not to supplant, it is to supplement. This organization is open to any company, mutual, co-op, Independent, and even the Bell System . . . . This organization is not against anyone, or any group of people, or any other organization. The purpose of this or-

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ganization is to permit a group of people with a common interest and a common cause to join together in group activity . . . ."

John A. Brady, Sr., president of the Rural Telephone Association addressed the convention. Discussing "What Can Be Accomplished Through R.T.A.," Brady covered the pros, cons, and purpose of R.T.A.

"We believe," he said, "that, irregardless of the financial structure of the companies concerned, the common interest that cements us together is the fact that we are, or have been, telephone borrowers from the Rural Electrification Administration — We also believe, that R.E.A. telephone borrowers have interests that are common with telephone companies that are not R.E.A. borrowers. We believe that companies should be members of groups that are working in their interest. In this field are the State Telephone Associations, the U.S.I.T.A., the N.R.T.C.A. and the R.T.A. This family of Associations works in the industry similar to the family at home .. . . Due to the purpose and intent of this organization and the fact that the 568 borrowers are located throughout 44 states and Alaska, it must be national in scope."

In a business session of the borrowers, the name "Rural Independent Telephone Cooperative Association" was changed to "Rural Telephone Association." It was felt that the words "Independent" and Cooperative" were misleading.

At the business session, tentative plans were made to hold the next meeting in Omaha, Neb. during the early part of May, 1958.

Other speakers were: Ben Smith, merchandising manager, Southwestern Bell Telephone Co., St. Louis, Mo.; representatives of Motorola presented an "Outline for Mobile Telephones in Rural Areas;" Hugh Wilburn, president of the Arkansas Telephone Association outlined "The Future Outlook for Smaller Independent Telephone Companies;" and Lloyd Teekle of the Forrest Hill Telephone Co., Glenmora, La., discussed "Observations of a Freshman in the Telephone Industry."—*By Herman R. McDonald.*

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SUTTLE

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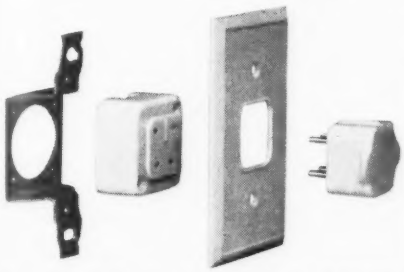
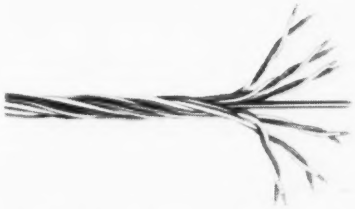
SUTTLE — Suppliers of Equipment to Telephone Men — Since 1910



STANDARD PLUG & JACK ASSEMBLY AVAILABLE

Now Independent Telephone Men can order the standard flush or non-flush type, 4-prong, wall-mounting plug and jack assembly from **Suttle**. Plug and jack bodies as well as the wall plate are made of high-impact, high-density styrene for greatest dielectric performance. Specify brown or ivory when ordering. For further information about this standard wall plug and jack assembly, write to **Suttle**.

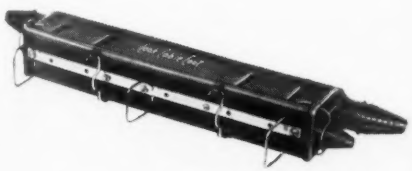


FOR CABLE RELIEF, TEMPORARY SERVICE

Fast, low cost construction is possible with **Ansonia** Lightweight Rural Distribution Wire. Has plastic-insulated #19 or #22 A.W.G. soft copper conductors in color-coded pairs cabled around a polyethylene-insulated .109 high-strength galvanized steel support wire. Each conductor pair has a controlled different length twist to avoid cross-talk. Breaking strength of 1800 pounds makes it ideal for temporary service or cable relief. Check **Suttle's** quote on your needs.

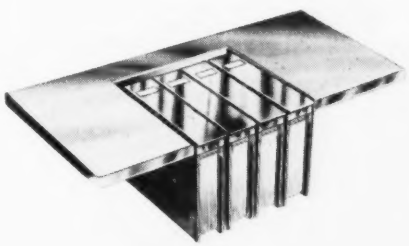
DESIGNED ESPECIALLY FOR TELEPHONE USE

This is the original **Columbia** Gray Label "Long Life" dry cell *designed* for telephone use. It delivers long service life with uniformity and dependability. These batteries are packed 12 per carton. A good supply is *always* at Lawrenceville.



ALL-IN-ONE CABLE COAT

Designed for Independent Telephone Co. installation, **Cook Electric's** Cable Coat eliminates the need for taped splices and potting. A flexible neoprene coat covers the splice area completely and can be opened without damage at any time. Terminal blocks are filled with plastic resin and furnished with stud jumper wires for making cable conductor taps. Make connections by tapping specified skinned conductors.



STEEL WALL UNIT HOLDS 4 DIRECTORIES

Just one of the many stainless steel-backed directory-catalog holders made by **Art Steel Co. Steelmaster** is this W-4 "Wallster." Designed for easy wall mounting, this standard unit holds four or more directories, with your choice of two sizes of binders. For smaller directories, too. This complete line of directory holders includes floor cabinet types in four colors. Write to **Suttle** for catalog listing complete line and prices.

K-500 CONTROLS GIVE EQUAL TRANSMISSION

The **Kellogg** K-500 standard battery desk telephone, with increased transmitting and receiving efficiency, works equally well with *all* classes of common battery, manual or dial service. Better speech quality is obtained through shorter handset. New, improved bias or harmonic ringers provided. **Suttle** stocks 'em!

Manufacturers, suppliers, and printers to Telephone Men

For further information, specifications or quotations on these telephone supplies— write, wire or telephone—

SUTTLE EQUIPMENT COMPANY

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suppliers NEWS briefs

Frank C. Davies Announces Retirement: Started His Telephone Career In 1919

LAST MONTH a veteran telephone man, Frank C. Davies announced his retirement from active participation in the management of General Telephone Directory Co., Des Plaines, Ill. He will continue as chairman of the board of directors.

Davies' immediate plans include enrolling at the University of Washington, his alma mater, for study. He also intends to write articles, short stories, and possibly a history of the early days of the West.

A long and successful career within the telephone industry has kept Davies occupied for nearly 40 years. In 1919 he joined Interstate Utilities Co., now General Telephone Co. of the Northwest. In 1923 he was elected a director of the company and by 1929 he was assistant general manager of the firm.

FRANK C. DAVIES retires from active duties with General Telephone Directory Co.

When control of the firm was acquired in 1929 by Associated Telephone Utilities Co., a predecessor holding company of General Telephone Corp., he was transferred from Spokane to Los Angeles and placed on the staff of the operating vice president of the Western Companies. During this period he dealt primarily with commercial and traffic assignments. In the next few years he worked at various administrative posts, first with Associated Telephone Co., Ltd. and Associated Telephone Utilities Co., Inc.

It was while serving as commercial operations engineer for the System that on January 1, 1935, Davies was elected vice president of Tel-Ad Publishing Co., a forerunner of General Telephone Directory Co.

In his dual positions as commercial operations engineer for the System and as a vice president of Tel-Ad, Davies had the opportunity to formalize plans for a nationwide telephone directory publishing company. It was his idea to expand Tel-Ad and to use the directories of the General Telephone System as the nucleus of this undertaking. He was designated as president-to-be of the company while it was in the process of being planned.

During his years at the helm of the directory company he saw it grow into an international organization with division offices in 10 centers of the U.S.A., plus Hawaii and the Philippines, an organization that publishes directories and promotes the use of Yellow Page's advertising for Independent telephone companies in about 4,500 communities.

C.S. Cadwell Retires As Pres., A. E. Int'l: Gene K. Beare Named President

CHARLES S. CADWELL has retired as president of Automatic Electric International at his own request for reasons of health. He has been succeeded by Gene K. Beare, formerly vice president in charge of production of Automatic Electric Co. Beare has been succeeded by Robert J. Gressens, manager of the industrial products division.

In announcing these executive changes, Donald C. Power, president of General Telephone Corp., the parent company, stated that although Cadwell is recovering satisfactorily from a recent coronary attack, his doctors have advised that he should not look forward to resuming the heavy work load and extensive travel that the presidency of Automatic Electric International entails.

Cadwell will continue as a director of Automatic Electric Co., Automatic Electric International, and certain other affiliated companies, Power said, in order that these units of General Telephone may continue to receive the benefit of Cadwell's wide experience in the telephone industry.

Cadwell has been active in the affairs of Automatic Electric for over 35 years, serving in a wide range of capacities, including commercial and sales, technical and manufacturing. He was elected president of Automatic Electric Co. in 1947, and became

C. S. CADWELL retires as president of Automatic Electric International, Inc., Chicago.

GENE K. BEARE, new president of Automatic Electric International, Inc., Chicago.

president of Automatic Electric International in 1955.

Gene K. Beare, Cadwell's successor as president of Automatic Electric International, entered the telephone business by way of the Southwestern Bell Telephone Co. in St. Louis, Mo. He joined Automatic Electric in 1939 as assistant to the president, was named commercial manager of affiliated companies in 1946, general commercial manager in 1947, production manager in 1948 and elected vice president in charge of production in 1954. He received his engineering degree from Washington University in St. Louis and his Masters in Business Administration from the Harvard Graduate School.

R. J. GRESSENS now heads A. E. Co.'s mfg. organization.

Robert J. Gressens, who now heads the manufacturing organization at Automatic Electric Co., received a liberal arts degree at Harvard University and an engineering degree at Illinois Institute of Technology. He joined the company in 1951, and after completing the company's training programs, served as Beare's executive assistant until 1956, when he was named manager of the industrial products division.

Zippertubing Company Opens New Telephone Division

A NEW DIVISION specializing in the design and production of materials for the telephone industry has been opened by The Zippertubing Co., Los Angeles, Calif.

Zippertubing is a flat vinyl tape, which is wrapped around wires and cables, then zipped shut with a detachable pull tab. The cable may be sealed with a liquid sealer supplied by the manufacturer, thus providing a permanent, waterproof, air-tight jacket.

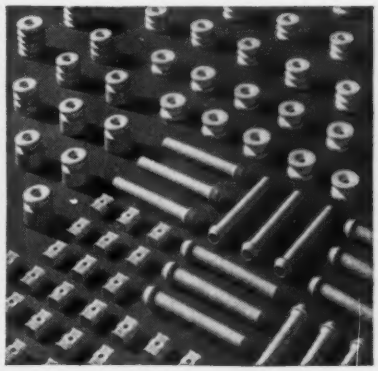
Research preceding the opening of the Telephone Industry Division has revealed many applications for Zippertubing in both outside and inside plant telephone cabling, the company states.

For example, to prevent cross-talk, the recently developed Shielded Zippertubing may be zipped around existing cables. This new material, made by laminating a copper or aluminum

PORCELAIN PRODUCTS

TELEPHONE INSULATORS

. . . The RELIABLE Line



Telephone industry acceptance has *proved* Porcelain Products . . . the reliable line of telephone insulators. Porcelain Products assures unvarying uniformity . . . strength . . . precision manufacture and rigid inspection—always dependable. A complete line for every application. Keep your service standards high—with Porcelain Products' telephone insulators. Backed by 60 years experience producing porcelain insulators. Ask you jobber or write us direct.

Porcelain Products, Inc.

CAREY, OHIO

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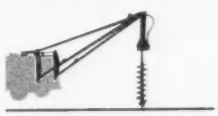

IT DIGS

IT LIFTS

1 UNIT DOES WORK OF 3

The TRUCO HYDRAULIC DERRICK is simple, safe and easy to operate. One man can position derrick, dig hole and set pole. Live "Middle-Leg" keeps constant pressure on augur...raises and lowers derrick.

Cuts Equipment Costs one-third. Write Truco for more information.

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3963 Walnut Street

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Question: What makes the CHANCE 808 GUY GUARD the groundman's preference?

Answer: Ease of Installation!

Guy Guards that are easy to install are easy to get installed where and how you want them. The Chance 808 is an inexpensive guy guard designed for fast, easy installation. Even a midget can install it—there are no high bolts to fasten at the top—only one bolt at the bottom.

The 808 hooks easily around the guy wire at the top. The hook binds to hold tight when bottom of guard is brought into position. Hook holds guard away from wire to eliminate noisy vibration. Flanged edges of hook prevent strand cutting, and help to keep guard in position.

Single bolt at lower end of guard fastens to guy rod . . . or to guy wire . . . or to guy loop. You get proper installation every time.

Economical too!

The Chance 808 is economical in first cost . . . in labor costs . . . and in service. It is made of heavy gauge steel, hot dip galvanized for long life and high visibility. Edges are turned in for extra safety and rigidity.

Get the Chance 808 from your Line Equipment Wholesaler. Your groundmen will like its features . . . and you'll like the savings.

A·B·CHANCE CO·
CENTRALIA, MISSOURI
(A. B. Chance Co. of Canada, Ltd., Toronto)

CP58-4

foil to any of the packet materials, provides an armored cable without the use of machinery or laborious hand wrapping.

Employing Zippertubing also will eliminate the packing and taping of incomplete cable splices which formerly was necessary at the end of each work day. Now Zippertubing simply may be zipped around these splices and taped at the ends, providing an easily re-accessible splice.

To insure safety, Zippertubing may be applied around existing interior cables which are no longer properly insulated. It is also possible to add rodent repellent and fungicide to the jackets for protection of underground and aerial cables.

Other applications are as switchboard cables, chafing and tree guards and — through the use of perforated Zippertubing — for main frames.

Zippertubing is available in a variety of colors. Sizes range from $\frac{3}{8}$" up in increments of $\frac{1}{8}$", in lengths of 20-1,000 feet. Brochures, price lists and more technical information are available from *Reader's Service Dept., TE&M, 7720 N. Sheridan Rd., Chicago 26, Ill.*

Leich Announces New Sales Representatives

D. C. GIBSON, president of Leich Sales Corp., has announced the appointment of new sales representatives for Texas and Minnesota.

The appointments, according to Gibson, are the latest steps in Leich's

CHARLES F. NORSCH, new Leich representative in Texas.

E. C. "BUD" VICK, new Leich representative in Minnesota

expansion program. They represent the fourth and fifth new Leich salesmen added in recent months.

Charles F. Norsch is the new Leich representative in Texas. He has been assistant to the manager of the Southwestern district in Leich's Dallas office for over four years. He has handled much of the correspondence and telephone calls from telephone companies in the area, so he will be calling on people with whom he has worked in the past.

E. C. "Bud" Vick, will represent Leich in Minnesota. After a training period in Leich's Chicago office, and Genoa, Illinois, plant and warehouse, he will be calling on telephone companies.

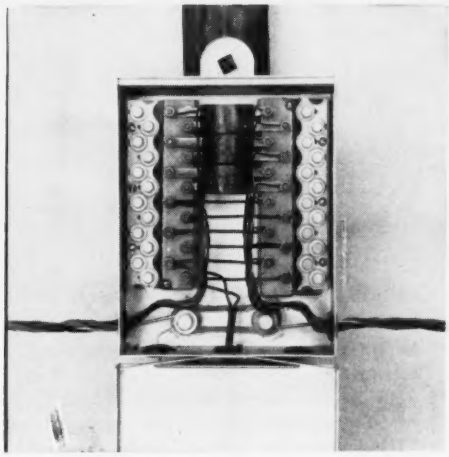
Mississippi Valley Tel. Co. Buys Microwave Equipment

COLLINS RADIO CO., Cedar Rapids, Ia., has announced the sale of a $142,343 microwave carrier system to the Mississippi Valley Telephone Co., Carthage, Ill.

The Mississippi Valley company is making the purchase as a part of a four-phase overall modernization and expansion program, which includes complete conversion to dial telephone equipment. The initial order will be for equipment to operate eight voice channels and one teletypewriter channel between Carthage and Dallas City, and 14 voice channels between Carthage and Hamilton.

Phase one, construction of build-

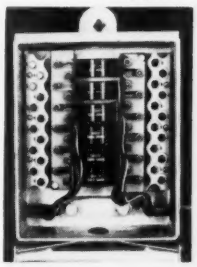
HERE IS OUR . . .
Type 177
TERMINAL LOADING CASE



for 6, 11, and 16 pair Rural Distribution Wire

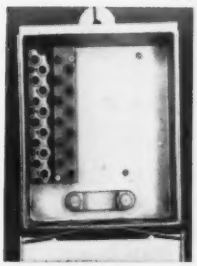
Cast aluminum combination terminal box and housing for loading coils. Designed to be used for rural distribution wire for 6, 11 and 16 pair capacity and available in 8 types to meet your requirements. Terminals are available with or without protectors and designed to accommodate loading coils of 88 MH or 44 MH inductance.

Types 177A-177B



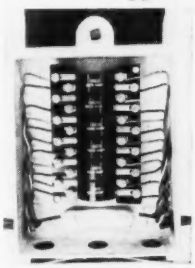
Contains two protected terminal strips complete with type 637A(88MH) or 637 B (44MH) coils.

Type 177F



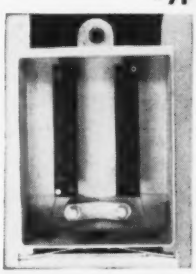
Contains one protected terminal strip —no coils.

Types 177C-177D



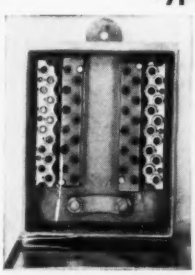
Contains two non protected strips complete with type 637A(88MD) or 637B(44MH) coils.

Type 177G



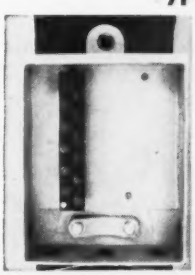
Contains two non protected strips — no coils.

Types 177E



Contains two protected terminal strips—no coils.

Type 177H



Contains one non protected strip—no coils.

AVAILABLE THROUGH ALL TELEPHONE EQUIPMENT SUPPLIERS

COMMUNICATION EQUIPMENT & ENGINEERING COMPANY
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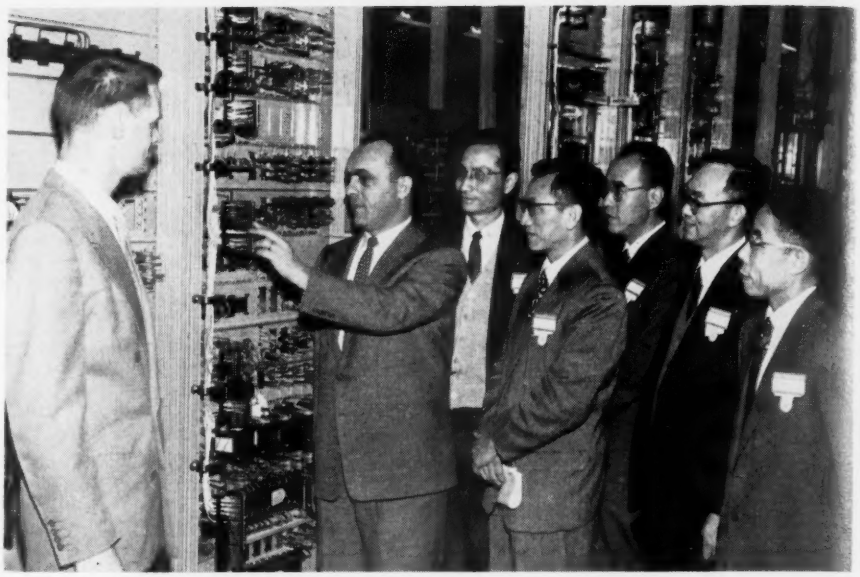
ings to house the equipment and construction of the microwave link connecting Carthage and Dallas City, a distance of 15.7 miles, is scheduled to begin immediately and completion is expected within six months. Phase two, the hop between Carthage and Hamilton, 10.5 miles, will be in operation six months following the completion of phase one. The order placed with Collins covers phases one and two.

Mississippi Valley's tentative plans are to place in operation 11 voice channels between Carthage and Warsaw, 15.5 miles, in phase three. Phase three construction is scheduled to be finished eight months after the completion of phase two. Phase four will place 8 voice channels in operation between Carthage and Nauvoo, 16.25 miles, eight months after the completion of phase three.

Replacement of open wire lines by microwave radio transmission under the four-phase program will provide improved service for 3711 of the current 4645 phones operated and serviced by the Illinois firm. Mississippi Valley officials indicated the inside modernization program will proceed in approximately the same steps as the outside construction plan, and that the dial conversion and microwave installations would be fully completed during 1960.

The Collins radio frequency equipment to be used in the system operates in the 6200-megacycle common-carrier band. Hot standby equipment will be provided to assure the highest degree of system reliability. In Collins microwave radio frequency equipment, automatic switching from main to standby is inherent in the radio frequency system with manual switching also provided. Squelch, provided at each station, will prevent noise from saturating the system in the event of a deep fade or path failure.

This Collins equipment incorporates a dual regulator which receives the composite baseband signal and maintains a fixed output level for a plus or minus 6 decibels variation of input signal. A service channel operating independently from the carrier drops will be included to facilitate maintenance procedures and adjustments.



Five industrial engineers from the Republic of China (Formosa) visited Stromberg-Carlson, a division of General Dynamics Corporation, recently during a tour of the United States under the auspices of the International Cooperation Administration of the U. S. State Department. From left, ROBERT SPARKES of Stromberg-Carlson's production engineering department and MORRIS SOFFER, manager of production control, show power boards used in Stromberg-Carlson telephone systems to CHENG KUO, superintendent of the cyanamide plant, Taiwan Fertilizer Co., Ltd.; YEN CHAO, manager of planning department, Taiyang Mining Co.; WU KE, chief engineer of the seventh distillery, Taiwan Tobacco & Wine Monopoly Bureau; HSU LUNG, assistant manager, Jing Yie Textile Mill, Ltd.; CHWANG TSIEN factory manager, Continental Engineering Corp.

The microwave carrier equipment will utilize Collins' high-density carrier system. Each separate communication path will have a usable spectrum space of about 3600 cycles. The upper portion of the spectrum will provide space for a 3400 cycles per second signal, which will be the agency for transmitting telephone ringing signals over the microwave.

Twelve channels will be formed into a base group, beginning at 60 kilocycles and extending to 108 kilocycles with each channel occupying a 4 kilocycle band-width. The base group carrier frequencies will be 420, 468, 516, 564, and 612 kilocycles, and the channel carrier frequencies will range from 60 to 104 kilocycles at 4 kilocycle intervals. The 308 kilocycle frequency will be reserved for the pilot frequency used for system level control and frequency reference. The resulting 5 base groups, after modulation, will result in 5 group signals located in the spectrum between 312 and 552 kilocycles, each group being 48 kilocycles in band-width.

L. M. Berry & Co. Honors Nine Veteran Employes

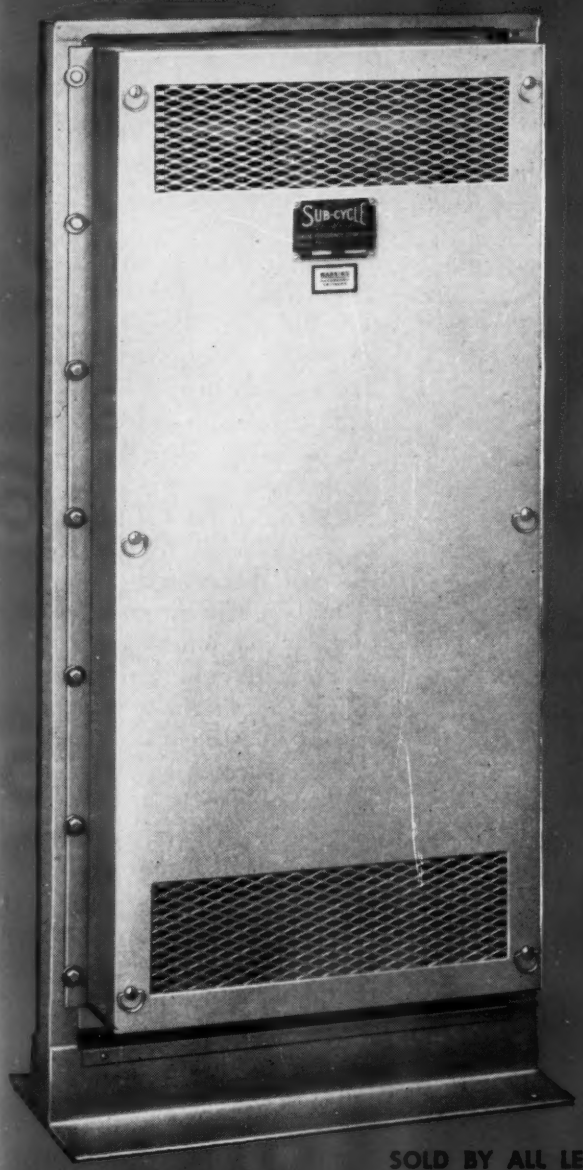
NINE L. M. Berry & Co. employes were recognized for long service to the firm recently, when they were feted at a banquet in Dayton, Ohio. Loren M. Berry, founder of the company, presented each employe with a gold watch and a certificate of service.

Honored for service of 25 years

another FIRST by Lorain!

THE S-5 SUB-CYCLE

FOR SYNCHROMONIC RINGING!



PERMANENT

Dependable

OPERATION!

YEAR AFTER YEAR

Making use of a unique conversion principle combined with basic Sub-Cycle circuits used repeatedly in other Lorain equipment, the S-5 Sub-Cycle has power to spare. Depend upon it to deliver full-rated capacity even under the most gruelling conditions. It has excellent voltage regulation, and will always deliver the exact synchromonic ringing frequencies. The S-5 has no moving parts; therefore, it provides the permanent, maintenance-free, economical operation that is characteristic of all Sub-Cycles.

The Model S-5 can be equipped to supply either 15 cycles or 20 cycles as the fifth frequency; if only four frequencies are required, the converter is designated as a Model S-4. A minimum of floor space, only 24-3/8" by 15", is required.

WRITE FOR BULLETIN 169

SOLD BY ALL LEADING TELEPHONE DISTRIBUTORS

FLOTROL
PARTNERS IN DEPENDABILITY
SUB-CYCLE

LORAIN PRODUCTS CORPORATION · LORAIN, OHIO

(Continued from page 88)

or more were W. A. Steuer, H. C. Hull, Mrs. Fred Herbst, Miss Geraldine Lively, E. C. Longstreth, and W. J. Henneberry, all of Dayton; J. P. White of Louisville, F. L. Hawker of Rochester, and R. A. Maner of Tampa.

Steuer, general manager, who will observe his 30th service anniversary in March, joined the company in 1928 as an accountant in the general office. He was appointed general manager in 1941.

Hull joined the firm in 1929, and completed 29 years of service in January. After serving in various sales, management, and administrative positions for a number of years, he was named company statistician in 1952.

Mrs. Herbst was employed as a general office secretary in 1927, and observed her 30th service anniversary on Oct. 15, 1957. Since 1941 she has served as secretary to Mr. Berry.

Miss Lively joined the accounting department in 1932, and has been a member of the trade mark department since 1951. She observed 26 years with the company in January.

Longstreth was employed in August, 1926. Henneberry joined the company in 1929, and marked his 29th anniversary in January. Both men have served in sales and supervisory capacities throughout much of the company's operations in 29 states, and for the past several years have been assigned to the Ohio sales division.

White, southern manager of the company's telephone directory advertising activities, joined the firm in Louisville in 1920 as a salesman. After serving in sales and supervisory capacities throughout much of the company's operations, he returned to the Louisville office in 1936. He was named Southern manager on July 1, 1947. In this capacity he directs the activities of five southern sales divisions, which handle the directory advertising work for the Southern Bell Tel. & Tel. Co. in Kentucky, Tennessee, Alabama, Louisiana, and Mississippi.

Hawker, Eastern manager of the company's operations joined the firm in 1932. He will observe his 26th service anniversary on May 14. After serving in various sales and supervisory capacities, he was transferred to Rochester in 1934, where he was promoted to Eastern manager in November 1942. He directs the efforts of three sales divisions having operations in New York, Pennsylvania, Vermont, Virginia, West Virginia, the Carolinas, and Eastern Tennessee.

Maner, manager of L. M. Berry & Company's Florida division, joined the firm in Tampa as a directory advertising salesman in 1931 and will observe his 27th service anniversary in April. He served as a salesman and supervisor in various territories until 1941, when he returned to Tampa as

Shown above are the honored guests at L. M. Berry & Company's 25-year banquet as they display the watches received in recognition of long service. Left to right: W. A. STEUER, general manager; H. C. HULL, statistician; R. A. MANER Florida division manager; AGNES HERBST, general office; GERALDINE LIVELY, general office; W. J. HENNEBERRY, Ohio division; E. C. LONGSTRETH, Ohio division; F. L. HAWKER, Eastern manager. Not shown: J. P. WHITE, Southern manager.

a district manager. He was appointed Florida division manager in 1947. The Florida division handles the directory advertising for nine Florida telephone companies.

John S. Chafee Named Pres. Ansonia Wire & Cable Co.

EMMET G. GARDNER, chairman of the board of The Ansonia Wire & Cable Co., Ashton, Rhode Island, has announced the election of John S. Chafee as president, to fill the vacancy caused by the resignation of Alden P. Lunt.

Chafee attended Brown University and has had long executive experience in industry, including service

JOHN S. CHAFEE, new president of The Ansonia Wire & Cable Co., Ashton, Rhode Island.

with Brown & Sharpe Mfg. Co., Saco-Lowell Shops, Metals & Controls Corp., B-I-F Industries, Inc. During World War II, he was director of the Tools Division of the War Production Board.

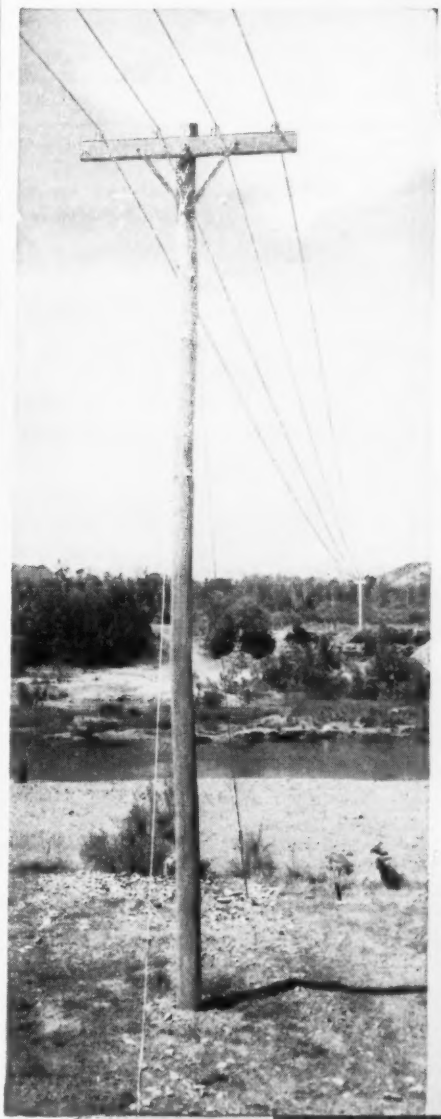
He is a trustee of the nationally known Butler Health Center of Providence, and served as chairman of the hospital trustee's study committee which developed the plan for that institution, formerly the Butler Hospital.

The Ansonia Wire & Cable Co. is a leading producer of plastic insulated wire and cable. During the summer of 1956, it transferred its operation from Ansonia, Conn. to a new and modern plant in Ashton, Rhode Island.

Crapo HTL-195

FOR EXTRA LONG SPAN RURAL LINES

The *NEW* *LOWER* Resistance Extra-High Tensile Line Wire



- **Better Voice Transmission**
- **Spans to 600 Feet or More**
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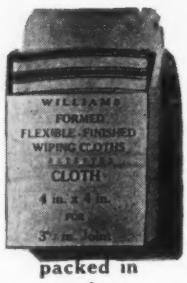

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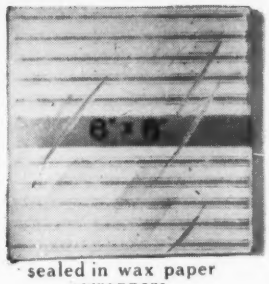

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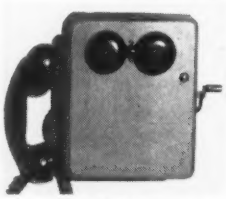
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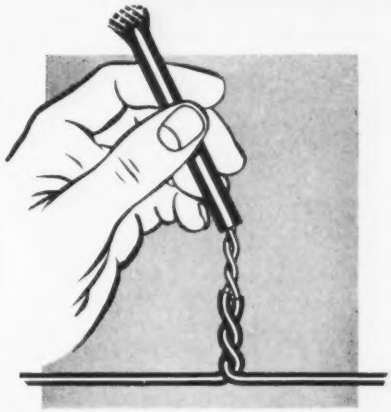

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Collins Succeeds Arnold As A. E. Carrier Chief

JACK B. ARNOLD who has been with Automatic Electric since 1948 has accepted an important new position with Automatic Electric International's affiliated manufacturing organization in Milan, Italy. He has been succeeded as manager of the Carrier and Radio Division of Automatic Electric Sales Corp. by Tate B. Collins, Jr.

JACK B. ARNOLD

Arnold, following a training period in Chicago, had previously served some five years as a staff engineer in the Rome, Italy office of Automatic Electric International.

Collins joined Automatic in 1952 after 12 years with Southern Bell Telephone & Telegraph Co.

TATE B. COLLINS, JR.

STROMBERG-CARLSON

Transmitter

A DIVISION OF GENERAL DYNAMICS CORPORATION

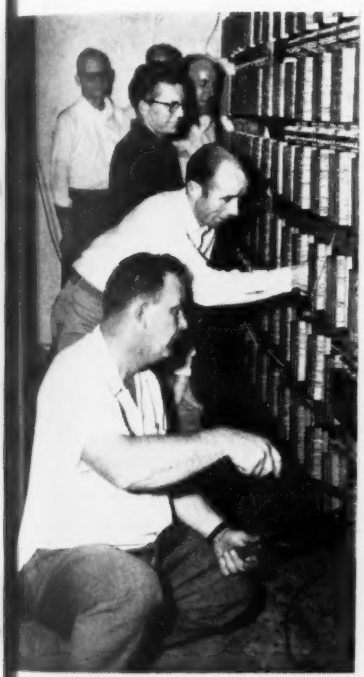
News and views of Independent telephone people. VOLUME 6, NO. 11 • FEBRUARY, 1958

The Daubendick Family is mighty important in Jefferson, Iowa

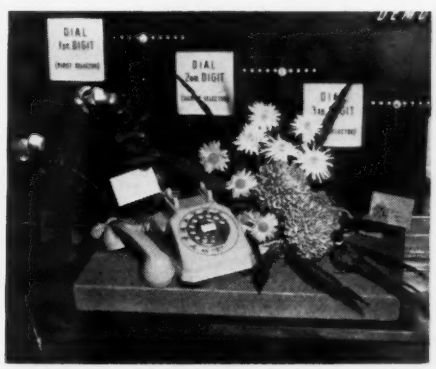
When one family runs the telephone company in a city, they are usually important people around town. The Daubendick family is mighty important in Jefferson, Iowa. And this November they completed a big job, with all the citizens as direct beneficiary; this culminated in the dial cutover shown.

Carl Daubendick has been around telephones for quite a while. How long is no secret, for it's all thoroughly documented in an excellent film "Fifty Years in the Telephone Business" —a visual record which he personally sponsored and supervised. Carl also trained up two sons who have established a firm place in telephone circles on their own.

In addition to their man-sized job in carrying through the modernization program at Jefferson, the younger Daubendicks operate the Jefferson Construction Company, specializing in small buildings and outside plant. Some of their acquaintance with XY-Dial came from their experience helping others put it in.



Gene Daubendick, Roger Turner, Howard Lower, Larry Buett, Bill Daubendick at point of cutover in Jefferson.



Good-looking and equally useful — the XY-Dial demonstrator for customer education in correct dial procedures.

1500 line XY-Dial office receives final check by Stromberg-Carlson installers. A 4-position toll board equipped for nationwide intertoll service supplements dial equipment in Jefferson.

Carl Daubendick (left) has been part of the progress from the ancient instruments and systems shown on wall to the present. Also watching Mayor Marten place the first call are Mrs. Marten, their young son, and Mr. Guy Richardson, a director of the Jefferson Telephone Company.

On Keeping One's Promises

The design engineer who has labored long and well until he has found the solution for a problem is convinced of the validity of his effort. When this solution takes the form of a new product, however, the tangible result of the engineer's work is a piece of equipment created under a different authority. It is then necessary to know how well the promises contained in the problem-solving idea have been kept.

When the Stromberg-Carlson Line Routiner was placed on the market, it promised much in the matter of speed, thoroughness and versatility. It can operate unattended at any hour; provide a permanent printed record of any faulty line encountered: and record the nature of that fault before proceeding automatically with the routining cycle. It can be centrally located, yet test lines in outlying exchanges. And it contains built-in self testing apparatus to "check the checker." The first unit had to *prove* that it could do all this before it was admitted to the Stromberg-Carlson line of products. This was a laboratory job.

As field acceptance led to an authorization for production, the need for appropriate test apparatus was apparent. The Test Equipment Engineering Department, working closely with the design engineer, set about to take each promise made for the equipment and subject it to the test. "Show me!"

A Test Fixture for the Line Routiner

by P. John Bird, Test Equipment Engineer

Certainly one way to test the accuracy of a 10,000-position Line Routiner would be to place it in a 10,000-line dial office and try it out. However, this is physically impracticable on a production basis. Moreover, it would not be a real test of the Routiner itself, since it would not clearly indicate whether the improper condition registered lay in the central office equipment being routined or in the routining device.

These two facts in combination made it imperative to design and produce a fixture for factory testing that would prove whether or not the Line Routiner was "telling the truth" in performing its functions.

Functions of the Line Routiner

In order to see what tests were necessary, it will be well to state first the basic functions of this Line Routiner:

a) to route a switch train to any one of the 10,000 lines consecutively (in sequence).

b) to apply tests to each of these lines for loop, ground and foreign potential.

In addition, optional wiring is provided within the Routiner for providing 3-digit impulses and impulse masking on unequipped lines.

(For a detailed description of the Stromberg-Carlson Line Routiner, see the July, 1957 *Transmitter*)

Why a Test Device?

One might ask the question: "If the Line Routiner is 'self checking,' why bother with a test device?"

Let's stop a moment and consider the problem involved. Ten thousand positions are possible on the Stromberg-Carlson Line Routiner with one of three different tests being applied to each position. Each of the 10,000 positions must also be tested *in sequence* so that the test man in the central office knows that every position has been accurately checked.

Now think back to the final inspection of the Line Routiner at Stromberg-Carlson. Can you imagine the almost impossible task of checking for continuity *each* of the 10,000 positions — one at a time and by hand? And even if each of these 10,000 positions were checked in sequence, that still would not prove that the Line Routiner is ready to do the checking automatically. Thus the need for a device which would give a nearly *infallible* test of the pulsing out sequence.

Compactness is also Important

At first thought it would truly need considerable equipment in order to ascertain that 10,000 lines were being tested consecutively from 1111 to 0000, this being the basis of a 10,000 line exchange. The provision for this quantity of equipment for test purposes would be impractical; a method had to be evolved which would reduce the equipment required while giving the infallible test mentioned above. *What was needed would be a compact piece of test equipment capable of doing the job of a* 10,000 *line switching system.* In production testing of elaborate equipment of this type, it is imperative the test include proof that every wire is correctly placed; that every solder connection is tight; that every function to be performed takes place as it should, accurately and without hesitation.

The Test Fixture in Operation

Essentially the test fixture designed to do this consists of two switch trains in order to test all the various facilities provided by the Routiner. Each set of switches is provided with its associated trunk circuit for gaining access to the switches from the Routiner. A key mounted on the test fixture allows changeover from one train of switches to the other.

We could not have the Line Routiner pulsing the test fixture because, independent of the test equipment, it would not prove that the test equipment was out of step with the Routiner. The test equipment is arranged to step in single steps when correct indication of the line reached is given.

Briefly, the fixture successively:

1) Checks that part of the Line Routiner which performs the three tests to the accuracy for which it was designed.

2) The person inspecting the Line Routiner, with the aid of the

The Stromberg-Carlson Line Routiner

test device, first determines that the fault-indicating equipment of the Line Routiner is working accurately.

3) The inspector then switches the test equipment to automatic operation, sending the Line Routiner through all 10,000 positions in sequence, simulating on each of these steps one of the three conditions (at random) to be tested: loop, ground or foreign e. m. f.

4) Any fault in the Line Routiner will cause the test fixture to stop at that point. The inspector can readily tell the position of the fault.

5) About 7 hours are necessary to send the Line Routiner through all 10,000 positions; at the end of that time a complete record of the conditions found for *each* position is available to the inspector, who then compares the printed record produced by the Line Routiner with the known conditions simulated by the test device.

Far from being a trial and error method of design and inspection, the entire operation in the production of this test device — typical of the many problems faced daily by the Test Equipment Engineering Department — starting with the basic need right through to its final use, has been a fully scientific endeavor in keeping one's promises.

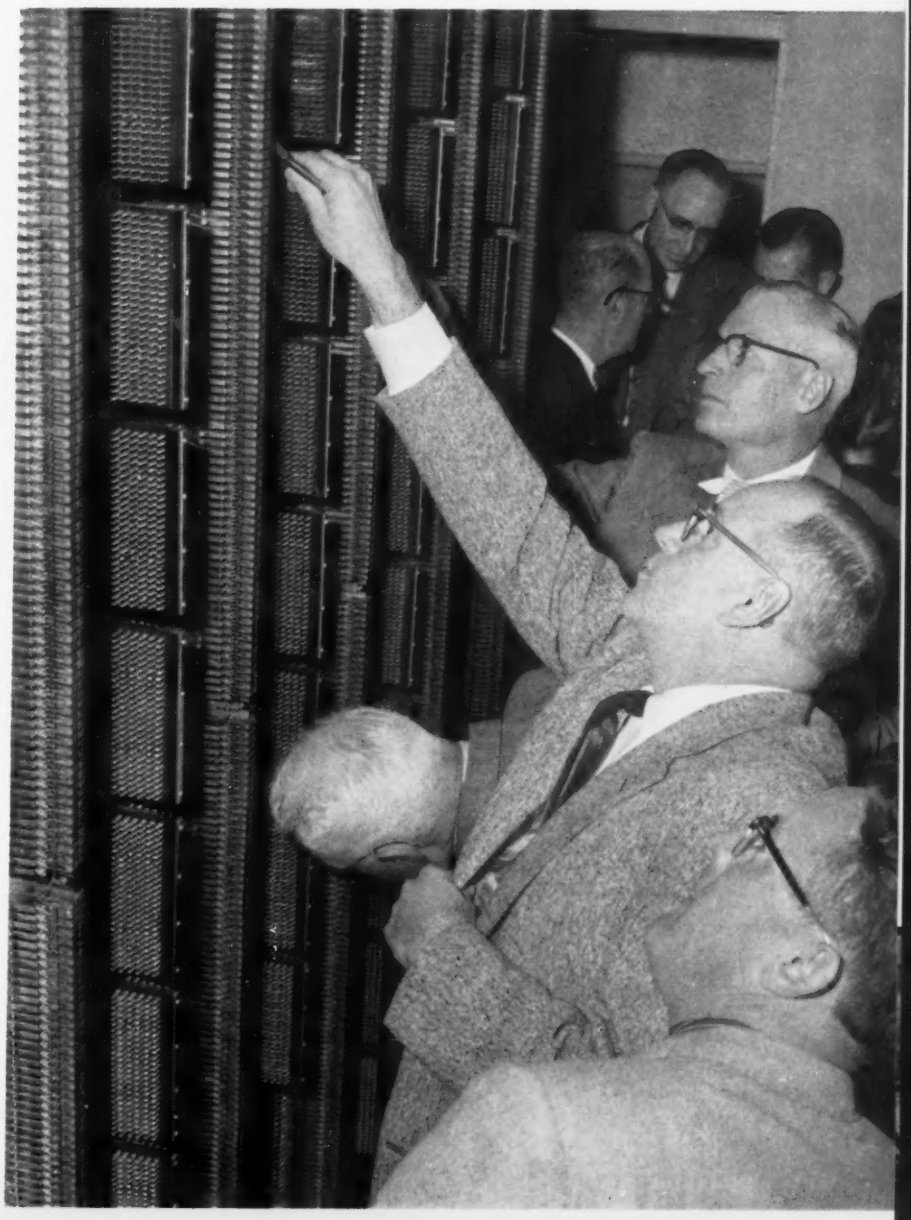
Telephone call to sister city in Maryland marks start of dial service in La Plata, Missouri

When Mayor M. E. Belt of La Plata, Missouri, called the mayor of La Plata, Maryland, the call and the conversation not only marked the start of XY-Dial service to the citizens of La Plata, Mo., but also brought the sister communities, about 1,500 miles apart, a little "closer together."

The first dial call from the Missouri city climaxed the preliminary cutover celebration, which included a dinner for about 60 guests of Scott Gault, owner of the La Plata, Mo. Telephone Company, and signaled the start of the real cutover, which changed the remaining hundreds of telephones in the community to dial service. Dean Powell, Bill Woods and Roland Cull, employees of La Plata Telephone Company, started "clipping" terminal wires.

The unique conversation between the two mayors brought out the finer points of the two La Platas, including the trend of good business in the northern Missouri community, and the story that the Maryland Community was named for La Plata, Missouri.

This is the third time we have been privileged to salute one of the Gault Brothers on conversion to XY-Dial. All four are owners of independent companies in Kansas and Missouri.



The man with the "clippers" is John Gault, owner of the Buffalo (Mo.) Tel. Co., who came to help his brother, Scott, (center) at the La Plata, Mo., cutover. Also on hand were Al Gear, Stromberg-Carlson sales engineer, foreground; Byron Bridger, Mendon Sumner Tel. Co., Mendon, Mo. (bending down).

Plans begun by Walter Carlson completed with XY Dial cutover at Covington, Ohio

These men helped complete plans for the West Ohio Telephone Company. Front to back are: A. Clem, West Ohio installer; W. Vanscoy, manager, St. Paris; D. Hite, West Ohio installer; J. Tucker, Stromberg-Carlson installer-foreman, and J. P. Vallani, installer.

At St. Paris, Ohio, Donald K. Carlson and W. Vanscoy worked closely in making conversion to XY Dial a success.

Smiles indicate all goes well at Covington; these men made it certain: Richard Davidson, Stromberg-Carlson Service Engineer; Donald Carlson; S. Miodus, installer.

Donald K. Carlson, vice president of the West Ohio Telephone Company, has carried out the dreams and plans begun by his father, Walter E. Carlson, who was so well known throughout Independent telephone circles.

The work started by Walter Carlson, who was president and manager of the West Ohio company, and before that a Stromberg-Carlson sales representative, included the complete modernization of exchanges at Pleasant Hill, St. Paris and Covington. He lived to see both Pleasant Hill and St. Paris converted to XY-Dial.

Mrs. Walter Carlson and son Donald — already well known in telephone circles and currently president of the Michigan Independent Telephone Association — have finished the work begun by Walter; the third exchange, at Covington, has been converted, making the West Ohio Telephone Company 100 per cent XY-Dial — continuing to give the good telephone service to which Walter Carlson dedicated his life.

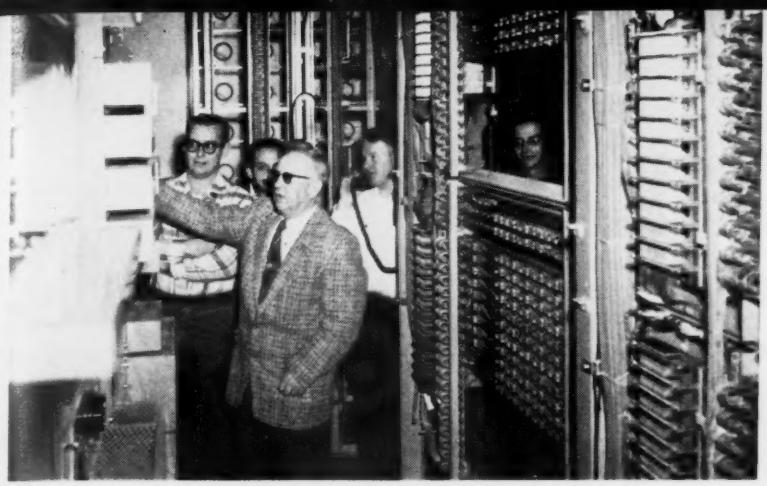
Dials are Clickin' at Flippin, Arkansas

Up-to-date exchange at Flippin houses new XY Dial equipment; is headquarters for Northern Arkansas Tel. Co.

More dials are clicking in Arkansas communities near the Missouri line, and the person responsible is Ray Sanders, who is president of the Northern Arkansas Telephone Company.

The recent conversion to XY-Dial operation at Flippin is only part of three years' planning by the company, and includes the new exchange at Bull Shoals, which is already dial, and the efficient operation at Flippin, company headquarters.

Even now plans are under way for establishing an exchange at Pyatt, just west of Flippin, as soon as necessary surveys can be completed; all a part of the overall improvement in telephone service for Northern Arkansas Telephone customers.



Preparing for cutover at the Cedar exchange of the Leelanau Tel. Co., John Sattler, manager, tests new equipment. Installers George Wood and Paul LaQuosta, at the left, watch the inspection of their work. Medford Sattler, vice president and assistant manager, helps with the test as Jack Eniodshofer, company serviceman, looks on.

New board anticipates growth in service for Telephone Company at Leelanau, Michigan

John Sattler, manager of the Leelanau Telephone Company, is sure that the new switchboard at Cedar, Michigan, will be equal to service demands now and during the anticipated growth period in the area served by the exchange — the heart of Michigan's summer vacationland.

The XY-Dial System easily grows with you; this was the prime consideration. Just two years ago the residents were provided with dial service — a system which was considered temporary at the time and proved to be just that.

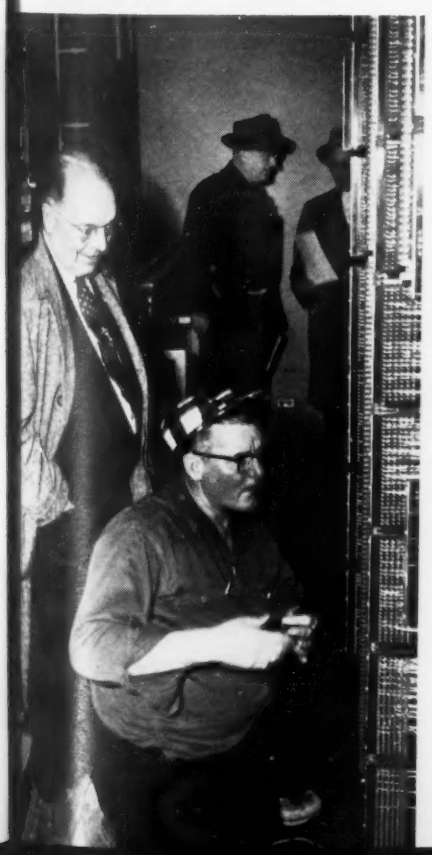
The first question residents, new to this section of northern Michigan ask is, "How soon can I have a phone?"

Now Mr. Sattler can provide them.

Job done . . . . short respite for men and truck.

No more "cranking" for Hartland, Maine, subscribers

Dr. A. L. Moulton, Hartland and St. Albans Telephone Company president, watches Plant Superintendent Lloyd Hubbard check last-minute details at Hartland cutover.



More than five hundred subscribers of the Hartland and St. Albans Telephone Company serving Hartland, Maine, are now dialing instead of cranking when they want to telephone their neighbors.

The cutover to XY-Dial was officially made by Lloyd Hubbard, plant superintendent.

Among those present at the cutover ceremonies were: Dr. A. L. Moulton, president; G. A. Moore, vice president; Miss Ina Moulton, treasurer; Percy Butterfield, assistant treasurer, all of the local telephone company.

Also Herman Kruger, REA field representative, Exeter, N. H.; Edward and Barry Holt, West Penobscot Tel. Co., Corinna, Me.; Clarence Todd, Oxford County Tel. Co., Buckfield, Me.; R. G. Trudell, design service engineer, Portland; Howard T. Stackpole, New England Tel. and Tel. Co., Portland; and Eugene Sullivan, Stromberg-Carlson sales representative.

Cutovers are fun — especially during a Maine winter! Enjoying both, in front of the Hartland exchange are: (second from the left) Dr. Moulton; (extreme right) Gene Sullivan, Stromberg-Carlson sales representative; and two unidentified owners of the Hartland Company.

Postman's Holiday No. 6

You can almost feel the line where East meets West in Texas

Near Navasota is Washington, a city when Houston was a village. Here Texan Independence was signed in 1836.

"No one takes our picture!" Juanita Wilson and Mildred Seely of Navasota Commercial . . . and some fine colored telephones.

"Let's have a cup of coffee while we talk." Mr H. Y. Price of San Marcos, Mrs. Evelyn Abney (left) and Mrs. George Forbes.

Part of America's first line of defense. Our tour through Convair Division of General Dynamics Corp. was necessarily circumspect.

Mr. E. H. Utzman, of Southwestern States Telephone Company, Barbara Bearron, gratified to be in occupancy at new Brownwood headquarters.

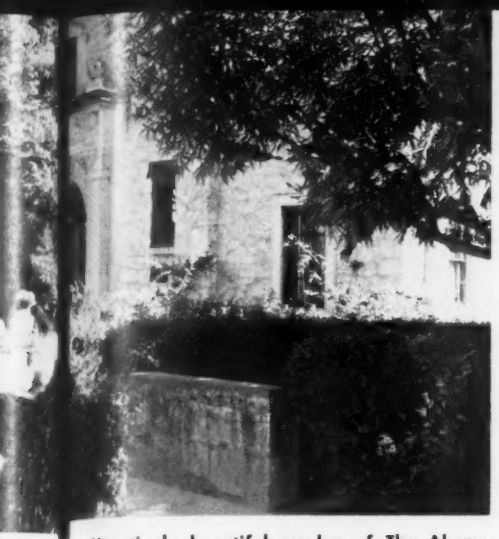
San Marcos toll traffic is heavy, partly because of military camp nearby. Portion of 6-position board.

Wire Chief's corner in XY-Dial room at San Marcos. Don Jackson, switchman, shows turret operation to Bill Reichel, construction engineer for Caldwell County Telephone Company.

Handsome building for Mid-Texas Telephone Co.'s Killeen office. Growth here is legendary.

Brownwood is both headquarters and an operating division of Southwestern States. A. J. Lacy, division manager, and Ouida Dunsworth.

George Franks, general manager at Navasota, which was one of first cities in Texas to have its own exchange.



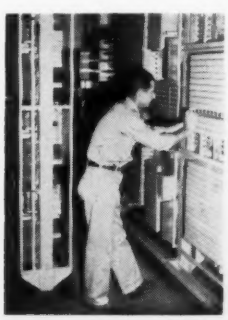
Hauntingly beautiful garden of The Alamo, beloved shrine of all Texans.

Ft. Worth and Dallas may not be feuding any more. But if you were to drop a plumbline on the map southward through the vanishing midpoint of these two lusty Titans, you would roughly describe the line where East meets West.

Our chapter this month begins on a Sunday, when only mad dogs, Englishmen, and your editor meeting a schedule would be out in the noonday sun. Even Prestone, which had ferried us safely across Death Valley one Fourth of July, proved inadequate: halfway between Galveston and Houston we boiled over!

Navasota is still East — corn, cotton, wheat, flax and watermelons .... by the acre, by the truck-load, and best of all by the roadside — iced and served with bib and fork. Twenty-five cents was never better invested!

George Franks welcomed us, both for himself and Mr. James Martin, president. Our tour began with history — the 1895 switchboard (it still can be operated and is often borrowed for exhibitions) which was featured in these pages in September.



Howard Hilley routining 1000-line XY-Dial exchange at Navasota.

Capitol building at Austin. Heroic in size, but several times outgrown.

But on the other side of the lobby attractive colored telephones proved that Navasota is geared to today. The impressive 1000-line XY-Dial office and the busy toll room — watermelons and other perishables can't wait for the mails — confirmed this. Industrial plants and the Gulf States Power Company use XY-PBX boards for their commercial needs. And all the surrounding towns are similarly served by XY-Dial on a tributary basis.

San Antonio is fascinating; superhighways and jet planes, skyscrapers and palatial motels (where other people stay), the Alamo and that unmistakable flavor of Old Mexico. Mr. W. S. Ban, the president of Mid-Texas Telephone Company, has his office here . . . graciously agreed to stay "overtime" to welcome us.

Plumb on the East-West line is *San Marcos*. Mr. H. Y. Price, manager here, explained that the Balcones Fault, cutting right through the center of town, divides Texas into farm land on the one side, ranching on the other. San Marcos benefits from both; has also enjoyed a boom under military training program with its lush toll traffic, as well as the more tempered growth of two well-respected educational institutions.

The XY-Dial office was planned for growth. Some of this was inevitable; some has come from greatly improved company-public spirit fostered by "Hy" Price — son of a pioneer telephone manager — who chose public service through a newspaper and public relations for the State as a forerunner to his successful career in the telephone business.

It's a short run up to Austin where we followed custom in recording our silhouettes on the capitol steps. It was with real regret that we missed the opportunity to meet Jack Haley — genial and efficient Secretary of the Texas Association. It did, however, give us a little more time with our old friend Bill Lyon at *Killeen*.

Bill was in good spirits, considering his problem. His building is outstanding, his growth has been phenomenal, his equipment room (full of strange devices) wanted only one thing — animation. When your station count jumps from 1,200 to 22,000 in eight years, and your biggest customer is the Army, you just naturally get furrows in your brow. Bill keeps them pretty well hidden under a smile that won't be daunted.

Brownwood is capital of one of the strongest Independents in the southwest. Justly confident of the future, the Southwestern States Telephone Company was in process of moving into one of the finest headquarters offices we have ever seen. Many whom we wanted to see were away: Mr. D. T. Strickland, vice president and general manager was in California; Mr. Harry Hammond, chief engineer, on vacation; Dick Post, public relations, at executive school in Michigan. But the "wheel" was in good hands, professionally and particularly in warmth of welcome.

Mr. E. H. Utzman, commercial superintendent, was host and chief guide — made sure that we saw all departments in the well-planned building and met the men responsible for each. These pages are poignantly inadequate to cover this company, its people or its operation — even if our schedule had provided the time. But in a few hours, one knows that here is strength, ability, efficiency.

If a concrete example were needed, it was provided. Mr. Utzman interrupted our visit to take a long-distance report on "operation clean-up" in Louisiana. Although given a knock-out blow by Hurricane Audrey at their Welsh and Pine Prairie exchanges, men and machines were mobilized, equipment transferred, and all but a few outlying subscribers were quickly put back in service by a round-the-clock counter attack.

Mid-Texas Telephone Company is a principal, but not single, business interest of Mr. W. S. Bain of San Antonio.

"I am Mrs. Herwig, secretary to Mr. D. T. Strickland. He's terribly sorry not to be able to welcome you to our Brownwood headquarters."

Big problems are whittled down to size through organization and teamwork.

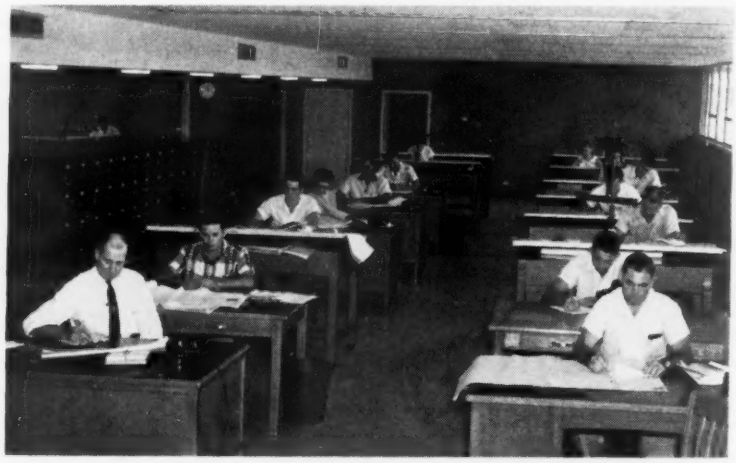
Dial conversion by this company have been stepped up to the point where the 100%-dial goal is well within sight. Stromberg-Carlson, working closely with the men who guide this company's destiny, has pride in the role it has taken in their achievement. Seldom has the customer-supplier relationship been marked by equal understanding and mutual respect.

Ft. Worth might seem "out-of-bounds" for this trip except that it is the home of another division of General Dynamics Corporation: Convair. Here we were greeted as "family," shown what time and security would allow. If you want to feel really small, stand under the wing of a giant bomber, looking down the assembly floor toward the far end of the building — one statute mile away and lost in blue haze! If you want to feel confidence in America's ability to keep pace in the air age, look at some of the late models which have recently shed their wraps. More encouraging still, we presume, are the developments which can not be discussed.

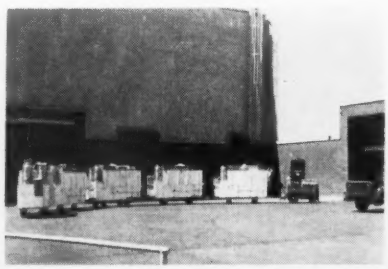
"Welcome to Texas" said the sign. But this time we saw it in the rear view mirror as we sped north.

It certainly was nice to renew old friendship with Bill Lyon at Killeen. He left sales traveling for "peace and quiet" of manager's job!

Visitors at Southwestern States' Brownwood headquarters are amazed at completeness of job training program and equipment for employees.



We wished Harry Hammond had been here to show us the complete engineering section of which he is justly proud. This shows Southwestern States equipment engineers; on other side of filing cases is plant engineering.



There can be no "central" cafeteria in a plant as large as Convair, so lunch train takes food to worker's locations.

Mr. C. R. Lee has fine quarters at Brownwood for his traffic group.

The office is your customers' principal impression of telephone company. At San Marcos it carries dignity and courteous efficiency.

Proud to be brothers! At Convair you ride from one part of the building to another.

Large XY Dial office of Gulf States Telephone Company at Stephenville, Tex. Mr. Arthur Anderson is manager here.

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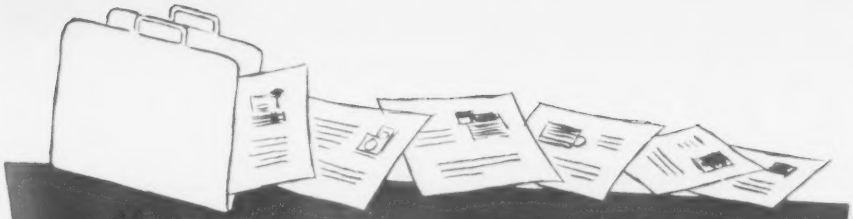

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THE BACK OF THE BOOK

By JOHN G. REYNOLDS

Shock Treatment For Voices

ANNE SMART, a public relations representative up in Toronto, Canada, shocks people into improving their telephone personality.

It's all done with the aid of a telephone recorder. She invites her audience to come up and talk over the telephone which is plugged into a recorder, "if they look as if they can take it."

When she plays it back to them she always gets the same reaction: "That's not me." Usually there's a friend

ANNE SMART has started a crusade to shock people into improving their telephone voices.

beside them who says, "That's exactly like you," and then the improving begins.

Miss Smart, who has been with the Bell Telephone Co. of Canada for 30 years, has had her share of marble-mouths. She's fed up with dreariness that depresses all listeners. She hates that sergeant-major bellow of some housewives.

So she's started her crusade in the women's groups of Ontario. Sometimes she demonstrates to 50, sometimes 100. Most of her talks this year will be in the Toronto area, since she recently changed her name to Mrs. Dalton Armstrong. Husband Dalton is also a telephone worker of some 30 years' standing.

In past years she's gone to every Ontario town. "I don't like to rush away after my meeting," she smiled. "So I usually stayed the week talking to groups afternoon and evening, and getting to know the women of the community."

Women who talk with cigarettes in their mouths should be drawn and quartered. "I can't give them speech therapy," qualified Anne, "but I can let them hear just what other people hear. If a woman has a breathy voice I can tell her how to correct her posture so she can cut down her puffing. I can advise on syllable and vowel pronunciation."

She also educates the people to direct distance dialing. By the fall of 1958 subscribers will dial direct from their homes any place 75 miles from Toronto, Ottawa, Detroit and Montreal.

"Eventually we'll be able to dial all over Canada and the U. S.," she said proudly. "We hope, in future, to Europe."

Anne has a series of firsts to her credit. She was one of the first girls to do actual selling of equipment for the Bell. She was first woman supervisor of directory sales. She founded and was first president of the Bell's Women's Service club and was first woman to go out on lecture-demonstrations as part of her work in public relations.

What kind of a telephone does she have in her City Park Apartment? "Just an ordinary one, but you've given me an idea. I'd better ask for all the attachments in case one of my women asks me that question." —

Facts By Telephone

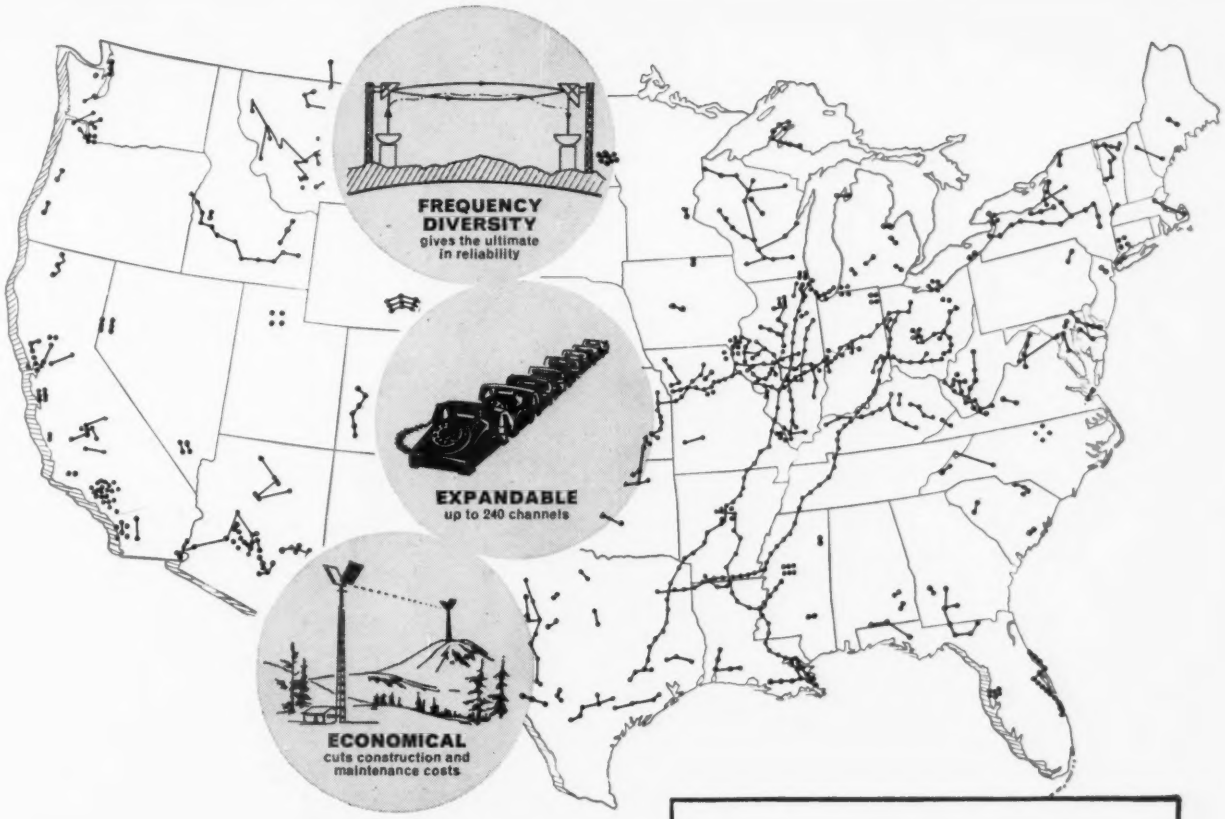
EMPLOYES of large companies often want to know how their company is doing. But they don't want to wade through a long and technically written report. One midwestern United States firm has come up with an interesting solution. If you are an employe of that firm and want to know about its annual report, you can just pick up the telephone and dial a special number. You will then hear a one-minute message which has been recorded by the company manager.

From Our Readers

ONE OF OUR subscribers tells us — "Theatre-Goers in Paris as usual have proved themselves masters of the fine art of one-upmanship. Rather than walk to the box-office to pick up tickets, they simply dial 'Theatre' on the phone, and reserve the seats of their choice. Olympia Theatre, to further help matters, maintains a fleet of scooters, which delivers tickets within the hour after a phone call . . ." *What's your favorite telephone story? Send it along.*

MOTOROLA MICROWAVE

gives unexcelled performance in multi-channel communications



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Write for Bulletin E-157.

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